



Special Report on Records Management Systems

First Edition (1.1)

A Doculabs Software Analysis Report.
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BACKGROUND INFORMATION

This section provides background information on Doculabs, on this study, on Doculabs assessment program, and on the technology sectors that Doculabs follows.

About Doculabs

Doculabs is an independent industry analyst firm guided by the principle that both vendors and end users benefit from objective feedback about product strengths and limitations. Founded in Chicago in 1992, Doculabs was one of the first industry analyst firms to ground its vendor and end user advisory services in unbiased, reality-based assessment results.

Doculabs uses its hands-on assessment to help end users choose the right technology solutions, and to provide critical feedback to vendors. Doculabs' timely, objective assessment results make its broad spectrum of advisory services, market analyses and research results among the most practical and valuable in the industry. Doculabs uses its reality-based product assessment to build a truly credible information bridge between end user need and vendor product development.

Doculabs has a growing staff of more than 20 analysts dedicated to product assessment, advisory services, and market analyses. The company specializes in emerging technology solutions in all facets of electronic document management systems (EDMS), electronic document output systems (EDOS), and technologies related to the Internet, intranets, and extranets (i*Structure?).

Doculabs' service offerings include advisory and consulting services, assessment services, and publications (reports and annual subscriptions). Because Doculabs does not resell products, we remain completely objective in our research and our recommendations.

For more information about Doculabs, call 312-433-7793, or visit our Web site – <http://www.doculabs.com>.

About the Study

This report contains the results and analyses of Doculabs' Records Management Systems Benchmark Study. All of the analyses contained herein are based on the opinions of the individuals who conducted the assessments. This study focused largely on configuration, implementation, and use. This study did not measure runtime performance.

These interpretive results should not be considered product endorsements by Doculabs. It is our hope that vendors will begin using a standard benchmark application suite, such as the one used in this assessment, to assist potential customers in forming their own comparative analysis.

We have worked diligently to ensure that the material in this document is both useful and accurate. Please be aware that errors may exist, and Doculabs makes no guarantees concerning the accuracy of the information found in this report. In particular, subsequent versions of the products may render some information in this report obsolete.

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Reproduction of this material in any form is strictly prohibited without written consent from Doculabs. Individuals or organizations interested in more information about this benchmark study should contact Doculabs, 1201 W. Harrison St., Third Floor, Chicago, IL 60607, (312) 433-7793. E-mail: info@doculabs.com. Web: www.doculabs.com.

About Benchmark Assessments

Most organizations evaluate and compare products by concentrating on features and functions. The truth is that most products in a given category achieve functional parity every six to twelve months. Therefore, when evaluating products it is critical to focus on the *process* of application development, implementation, and ongoing use.

This is the basis for Doculabs' benchmarking methodology. The approach is to assess a group of products in a specific category, using a real-world application scenario. We objectively analyze the product from start to finish, focusing on the different approaches that each product uses, and their impact on our ability to deliver a completed application.

Based on the assessment experience, we identify which of the products that we evaluated is the **current leader** or "**benchmark**" in key areas. Thus, Doculabs' benchmark program goes beyond features, helping both vendors and users discover more about the systems we evaluate in a manner that is entirely objective and yields comparative results.

Doculabs' benchmarking approach allows users to focus on those aspects of the system that are truly unique and that relate to implementation – without the bias of marketing hype and promises of future developments. Benchmarking also provides vendors a means to analyze how their products compare to others.

As you will see in this report, there is no overall winner or loser. Different applications have different functional and technical requirements, and certain products are better poised than others to meet particular needs. In the end, organizations must consider their own requirements and weigh them against the strengths of the products available in the marketplace. This study provides a framework to help evaluate products.

The net result of this study is to challenge an industry poised for significant growth to prove its ability to provide effective business solutions. For the vendors, please accept our opinions as a challenge to improve your offerings. All of the vendors willingly participated, which is a clear indication of their commitment to the market. Please recognize that the products included in this study are all appropriate for a diverse range of organizations.

EDMS Overview

Records management has only recently been seen as part of the growing electronic document management systems (EDMS) industry. The market extends far beyond traditional imaging and workflow, and includes technologies such as document management, records management, groupware, COLD, document input, electronic publishing, and search and retrieval. Various combinations of these products can be integrated to create systems for “knowledge management.” For organizations, the challenge lies in deciding which technologies offer you real benefits, then integrating them into a common strategy on an enterprise-wide level.

In general, all EDMS technologies are essentially concerned with the same thing: managing “electronic documents,” which can be any files that contain content. Examples include scanned images, electronically created files, reports, and even audio and video.

The following graphic identifies the traditional technology categories that make up the electronic document management systems (EDMS) market.

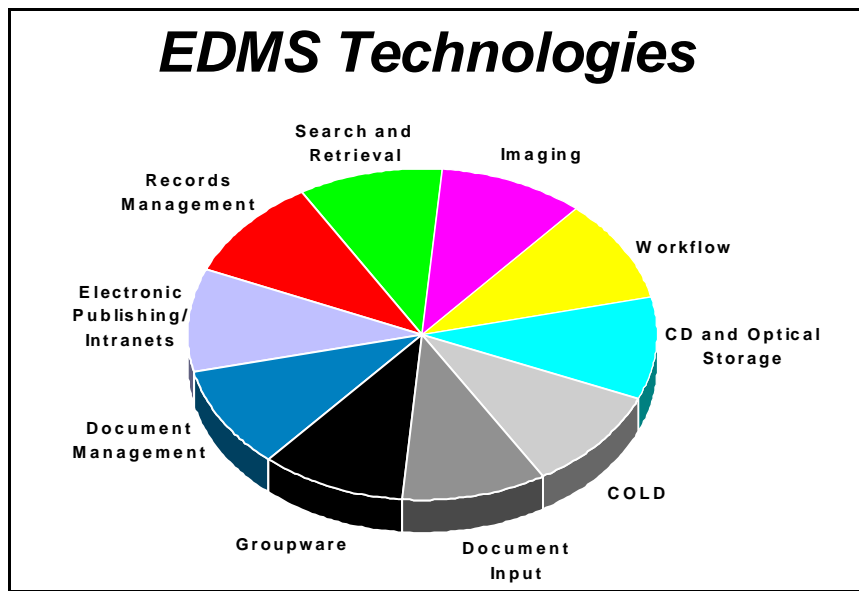


Figure 1 – EDMS Technology Categories

The following subsections describe each of these technology categories, and provide background on the system standards in place for those technologies (if applicable).

Imaging

Document imaging is a key component of efficient electronic document management systems. Imaging systems convert “human readable” documents (usually paper) into “computer readable” formats (electronic images). Imaging systems provide organizations with the ability to capture, store, archive, and retrieve document images. While the core of any imaging system is the back-end image management architecture, enterprise imaging systems can encompass many other technologies, such as optical storage and print/fax subsystems.

The TIFF (tagged image file format) standard is the commonly accepted image file format; it is supported by all imaging vendors and is interchangeable across systems. Another new format standard gaining acceptance is Adobe’s PDF (portable document format), but it has yet to be universally accepted by imaging vendors.

Workflow

Workflow systems are designed to automate business processes. Workflow processing technology is quickly gaining momentum as companies move toward more efficient, “paperless” offices. Production workflow systems allow organizations to define a routing and processing scheme that automates an orderly business process.

Whether stand-alone or as part of an imaging implementation, workflow systems can provide organizations with faster response time, increased productivity, improved customer service, and tighter quality controls. In addition to transaction-oriented production workflow products, new offerings are emerging to handle collaborative, administrative, and ad hoc workflows.

The most widely accepted workflow standards are specifications developed by the Workflow Management Coalition (WfMC). These specifications allow interoperability between different workflow systems through standard interfaces and data interchange formats.

Document Management

Document management (DM) software addresses a common organizational problem – the inability to retrieve and manage electronically generated unstructured information in an efficient manner. DM tools facilitate the needs of multiple users who work on a single document or a group of documents, regardless of document format.

DM tools give organizations the ability to profile electronically created files for fast and easy retrieval. The software allows documents to be associated with indexes that describe the file, such as document type, author, application, etc. In addition, the software tracks revisions made to documents and provides added security.

The Association for Information and Image Management (AIIM) has spearheaded the development of two key standards: the Open Document Management API (ODMA) and the Document Management Alliance (DMA). ODMA enables DM systems to work seamlessly with desktop applications; DMA enables different DM systems to work together.

Another important standard is Microsoft's Object Linking and Embedding (OLE), which is now fairly common in DM systems and many other applications. OLE technology allows you to place "objects" (files) created in one OLE application directly into another OLE application. This enables users to automatically invoke the native application of the embedded OLE object, and to automatically update the embedded object.

Records Management

The primary purpose of records management is to manage the risk and cost created by your organization's information (as embodied in physical and electronic form). Any type of business document (forms, invoices, correspondence, orders, etc.) can be classified as a "record." Once it is designated a record, the document is no longer managed by the creator, but by the organization – a fundamental difference from DM. The organization can choose to categorize the record in different ways, retain it for a certain length of time, and destroy it when the company is no longer obliged to retain it.

Organizations generally performed records management in response to industry regulations or to protect themselves from liability. The discipline of records management grew out of these business requirements. Likewise, the first records management systems (RMS) were designed to help records managers with their tasks. Today, the capabilities of RMS products have been expanded to handle electronic records, and to involve end users in the record classification and retrieval process. Many organization now look at their records repositories as powerful group memories, as opposed to liabilities the must be controlled.

Several new regulations are driving records management requirements, particularly in government agencies. For example, a new measure by the U.S. Department of Defense stipulates that all DOD agencies must use records management systems that have been certified as compliant with a core set of records management capabilities. In addition, a records management regulation that drew a distinction between paper and electronic records was recently repealed – meaning that agencies must treat electronic records and paper records in the same fashion. Regulations like these will pave the way for strengthened growth in the records management software market.

COLD

COLD (Computer Output to Laser Disk) represents one of the fastest growing segments of the document management systems industry. COLD systems download data in their print file format from a host system (usually mainframe reports) to a workstation. There, the reports are indexed and archived to a storage medium, which might be a hard disk, optical disk, CD, or tape. These stored reports are then available for retrieval or distribution.

Today's COLD systems provide fast access to information traditionally available only on paper, microfiche, or microfilm. Information is easier to find, retrieval times are faster, archival is easier, and remote distribution is a real option. If your business is not using COLD technology yet, you probably have a number of costs that you could reduce or eliminate by implementing COLD, starting the day your system goes into production.

There are currently no COLD standards in place. AIIM is spearheading an effort to define common modules and interface points across COLD products, an effort that may take a year or more.

Document Input

With any EDMS system, one of the key challenges is right up front – getting documents into the system. For this reason, the imaging and document management community has been paying close attention to document input technologies. For organizations looking at overall imaging systems, these input technologies are invariably a key piece of the puzzle.

Input technologies include scanners, document capture systems, character recognition, and forms processing packages. While these products do not offer archival or retrieval functionality, they provide the ability to create electronic images of paper documents, enhance them, automatically extract data from them, and make them available for import into an imaging system.

Today's input technologies offer robust functionality and provide a critical component of an efficient enterprise system. As the technology and the market mature, these products are offering more turnkey capabilities right out of the box, as well as tighter integration with imaging systems.

Electronic Publishing and Intranets

Just as it is important to get documents into the system, it is critical to get documents out of the system for distribution, often for specific uses or on specific media. Organizations have a wide range of options for publishing.

One option is “traditional” paper-based publishing. This type of publishing involves complex formatting and rendering technologies designed to facilitate sophisticated print jobs and even print-on-demand applications. Another popular strategy is to publish data to CD-ROM and CD-Recordable. These media types allows organizations to easily share large amounts of data with remote users, in a way that enables timely updates, improved accessibility, and reduced inventory and distribution costs.

Finally, the Internet is becoming more and more popular as a publishing medium. Organizations can publish documents to the Web or to private intranets. This simplifies the challenge of making the most current information available, and allows companies to control and monitor user access. Many organizations are setting up corporate intranets that use technologies such as Web servers, HTML authoring tools, and browsers.

Just as users have many publishing options, there are many publishing standards. Depending on the medium, standards may include PostScript, PDF, HTML, SGML, and ISO specifications.

CD and Optical Storage and Archival

All EDMS systems need cost-effective ways to archive information and to make it available to users when needed. One of the more commonly-used storage technologies is the jukebox. Jukeboxes are available for both CD and optical disk. These so-called “near-line” storage devices typically offer less expensive storage than on-line options such as magnetic hard drives, and they can hold extremely large libraries of information.

Another key technology is jukebox management software. This software acts as the intermediary between users and the device, giving users access to the data and handling all user requests and file transfers. In most cases, the jukebox appears to the user as just another logical drive. In addition, the software includes performance-enhancing capabilities that can help jukeboxes achieve retrieval speeds approaching those of on-line storage.

Groupware

A growing number of organizations are deploying groupware systems at an enterprise level. Groupware systems enable information to be organized and shared in a collaborative work environment. More than just e-mail, groupware is designed to help people collaborate through advanced features such as discussion databases, bulletin boards, electronic forms, and electronic schedulers.

Groupware systems like Lotus Notes, Microsoft Exchange, and Novell GroupWise can tie individuals together electronically, creating an automated, collaborative work environment with increased productivity. More and more, the groupware system serves as the “universal inbox” for an organization’s users, and is evolving into the dominant application or de facto “platform” in many organizations. And with the Messaging API (MAPI) standard, it becomes easier to integrate groupware with third-party applications.

Search and Retrieval

Text retrieval systems have been the stalwarts of libraries and legal systems for many years. This core technology is now being integrated in many other segments of the EDMS market, including DM, publishing, and COLD. Text retrieval is also becoming tightly integrated with the Internet, providing the ability to search Internet sites as well as allowing users to search and retrieve documents from a browser.

Text retrieval systems address one of the biggest problems of knowledge management: helping users find the information they need. Today’s text retrieval systems provide the ability to search for documents in a variety of different platforms, relieving the user from knowing or caring what format a document is in or where it is stored. Text retrieval systems also feature such sophisticated capabilities as natural language searching, heuristics, and summarization, which make the systems easier to use and improve searching precision.

About the Doculabs Special Report Series

Doculabs conducts regular benchmark assessments in all areas of the information management systems industry. Preliminary results are often published as articles in leading magazines and journals.

For many of these assessments, Doculabs also publishes “Special Reports,” which provide a general explanation of a particular technology area as well detailed product information based on real-world assessments. Each Special Report provides the following information:

- ?? Overview of the specific technology category, its target market, and its business benefits
- ?? Details on the assessment approach and methodology
- ?? Comparative analysis of all products evaluated
- ?? Detailed product reviews of all products evaluated

The Doculabs Special Reports are released at regular intervals throughout the year. The current series includes reports on these categories:

- | | |
|-------------------------|-----------------------|
| ?? Knowledge Management | ?? COLD |
| ?? Document Management | ?? Document Input |
| ?? Records Management | ?? Near-Line Storage |
| ?? Workflow | ?? Network Printing |
| ?? Imaging | ?? Datastream Viewing |

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I. INTRODUCTION

This report is the result of an independent benchmark study of records management products conducted by Doculabs. We installed and configured a number of leading records management products and used them to develop a real-world application. The systems were evaluated in early 1998.

The purpose of the study was to provide an overview of the records management market and technology, and to highlight the alternative offerings in the marketplace. In addition, the study provides organizations with a methodology to differentiate among the vast array of products available today, including criteria categories that are important to consider when evaluating records management technologies. For each category, we identify the “benchmark,” or current leader, among the products we assessed.

The remainder of this study is divided into the following major sections:

II. *About the Records Management Market*

Provides an overview of the records management marketplace and current industry trends

III. *About Records Management Technology*

Provides an overview of records management technologies, architectures, and product approaches

IV. *Assessment Approach*

Describes Doculabs’ assessment process, methodology, and the evaluation criteria used in the assessment

V. *Comparing Records Management Systems*

Compares the records management systems we evaluated for this study

VI. *Records Management Product Reviews*

Presents comprehensive reviews of all the records management software products evaluated in this study

VII. *Conclusion*

Discusses the direction of the records management market and some technology and market trends that will drive the market

Records Management Benchmark Study Participants

For this study we tested the following records management systems (RMS):

?? Cuadra Associates, Inc.
310-478-0066
www.cuadra.com
STAR 3.5

?? EDUCOM Business Solutions
215-340-2921
www.olap.com
RecordMANAGER 2.5

?? Information Network, IN Inc. (IN)
713-862-7954
www.intorm.com
InSight 32

?? Provenance Systems, Inc.
703-875-8701
www.provsys.com
ForeMost 6.3 and 7.0

?? PSSoftware
613-226-5660
www.pssoft.com
RIMS Studio 6.0

?? TOWER Software
703-359-4343
www.TOWERsoft.com.au
TRIM 4.1 and 4.2

For product comparisons, refer to Section IV, “Comparing Records Management Systems.” For product reviews, refer to Section V, “Records Management Product Reviews.”

About the Participants

All of the vendors included in this study participated voluntarily and paid a nominal lab fee to cover the cost of the resources and personnel required to conduct the assessment. This study represents only those products for which we have conducted a formal laboratory evaluation.

The group of products presented here by no means represents the industry as a whole, and the participants may not necessarily be the industry leaders. Vendors may decline to participate for any number of reasons, which may include a lack of resources for the evaluation or poor timing with respect to the product release cycle. Just because a product is not included in this review does not necessarily mean that the product is inferior to those in this report. Such an assessment can only be made through a hands-on comparison similar to the one used to generate this report.

Keep in mind that this test was not intended to identify a single winner or loser, and it was *not* a true performance test. Our analysis is designed to highlight each product's strengths, and indicate the applications for which each product is best suited. Clearly, other factors will enter into your evaluation process, such as the vendor's size and stability, its future direction, customer support, price, etc. Such factors were beyond the scope of this evaluation.

II. ABOUT THE RECORDS MANAGEMENT MARKET

The concept of records management is not new. Any type of business document (forms, invoices, correspondence, orders, etc.) can be classified as a “record.” Once a document is designated a record, the organization can manage it – categorize it in different ways, retain it for a certain length of time, and destroy it when the company is no longer obliged to retain it.

A record can be any document (physical or electronic) that has content, context, and structure. The content is the information the document contains. Context shows such things as the intended use, purpose, or recipients of the document (its history). Structure is the appearance, physical layout, or type of document (such as memo, letter, proposal, etc.).

Organizations traditionally performed records management in response to industry regulations or to protect themselves from liability. The discipline of records management grew out of these business requirements, and the first corporate records centers were designed around these goals.

Typically, records managers were concerned with a core set of tasks: classifying records, storing them in some logical fashion (such as folders, boxes, and shelves), tracking their location, retrieving them when needed for business reasons, and destroying them as soon as possible or moving them to a permanent archive. Records managers and archivists are well versed in these functional requirements.

But from a broader corporate perspective, records management has historically been a low-profile operation. In most firms, the records management group had little interaction with upper management, let alone corporate IT departments. The critical nature of records management tasks and requirements were generally not well-understood by the organization.

With recent trends in knowledge management, records management is now gaining the attention it deserves as part of an information management strategy. Organizations are realizing that their records represent a key corporate asset – a living corporate memory that can be used to improve business processes. And with the explosion of electronic documents within organizations, the need to manage and control organizational records has never been greater.

The First Records Management Systems

As the discipline of records management has grown over the years, software vendors have developed products for records management. The first software products for records management started to appear in the early 1980s. In general, these products were designed to make the job of records management easier, and were primarily concerned with paper records.

RMS technology helped records managers perform everyday tasks such as creating file plans and classification plans, establishing retention schedules, tracking records locations, and managing physical storage (shelf space). Records managers still handled paper and boxes, but at least they had a tool to help them track and find information, and remind them when to move or destroy certain records. RMS technology provided real value, assuming the records manager dutifully entered the information into the RMS.

Until recently, records management vendors positioned their products as solutions for a very specialized group: records management professionals who knew what they were doing. This meant that the products were not designed to appeal to an IT agenda or to the job requirements of more general corporate use. That was OK – companies had few records managers, and those people were specialists that understood the discipline of records management. This helped minimize issues such as cost of training, IT support, and usability.

The Difference Between DM and RM

A key challenge is to understand the difference between records management systems and document management (DM) systems. DM systems have plenty of capabilities, but they don't provide all the specific functionality that's required for records management.

Traditional DM systems normally store documents in a shared network, while storing associated metadata in a central database. Thus, the database controls user access, tracks versions, and allows searching. But users (with appropriate rights) still access and change documents – they are controlled by the creators. A fundamental difference in a records management system is that once a document is declared a record, *the organization* is responsible for managing it.

Most DM products lack the following critical records management capabilities:

- ?? Some method of declaration – a mechanism to define whether or not a document is a record
- ?? The ability to perform formal retention and disposition (destruction) based on their classification
- ?? The ability to track and control documents that are outside the system (such as on paper)
- ?? The ability to faultlessly track the location of all records, so that they may be located and destroyed according to the required retention schedule.

This is where RMS products shine. RMS products allow users to classify records according to the corporate records plan. The records manager can then apply formal records retention and destruction operations on the documents – specifying which documents to destroy, which documents to transfer, and when to do it. Thus, organizations can save and dispose of documents in accordance with an approved disposition schedule, and meet legislated archival and information access obligations.

In addition, an RMS can effectively bring both electronic and non-electronic records under its control (a capability some DM systems are also incorporating). This ensures that consistent profiling conventions are used across document types, no matter what the format or where they're stored. It also ensures that document access is systematically managed by the organization.

Unlike DM, RMS shifts document accountability from the end user to the organization. Once you decide to treat a document as a formal corporate record, the organization is responsible for the record, and it must ensure that the official version of the record is not modified. Thus, the record becomes subject to the official corporate retention and disposition plan, usually administered by a records manager. After all, it is the organization that is responsible for meeting obligations such as corporate policy or government and industry regulations, and using an RMS reduces the organization's exposure to costly litigation.

The following table, based on comparisons made by Julie Gable of Gable Consulting, compares DM and records management in terms of their primary distinguishing characteristics:

Characteristics	Document Management	Records Management
Primary application focus	Information-centric	Policy-centric
What application is designed to do	Manage information in documents, make it easy to find and access	Control corporate assets, ensure compliance
Role of a "document"	Information container	Evidence
Value basis	Re-usability, reference	Statutory, regulatory, operational, historic
Duration of usage	Instantaneous – used during creation, revision, or searching	Used during the entire life cycle
General attitude	All information is created equal; keep everything	Information can be our undoing; destroy it as soon as permitted

Table 1 – Differences between DM and RM

Major Forces Changing Records Management

The records management industry is undergoing tremendous change, which is being driven by four major forces:

- ?? Changes in technologies within organizations
- ?? Changes in customer demands for records management
- ?? New regulations and standards
- ?? Changes in the competitive landscape (vendors and products)

These factors have tremendous impact on each other and on the records management industry as a whole. A change in one factor (e.g., the introduction and universal acceptance of a new technology, like e-mail) can quickly affect the other factors and turn winning vendors into losers – and formerly happy RMS customers into bag holders.

Consider the interrelationship between the four forces driving the RMS market. For example, sweeping technology changes (explosion of electronic documents, e-mail, the Web, etc.) are creating new customers, but they are also changing customers' needs and expectations. New regulations and standards are also creating new customers, and changing the way in which customers go about their records management practices.

At the same time, the current RMS vendors are enhancing their products to meet new customer needs and new regulations. Meanwhile, new vendors are entering the fray to fill the gap between what customers demand (or will likely need in the future), and what the current vendors are providing today.

The remainder of this section explores each of the four driving forces in the records management market.

Changes in Technologies within Organizations

More and more organizations are starting to take notice of records management, and the technology is starting to emerge from the back office and assume a more high-profile strategic role within organizations. This transition means that organizations have a need to include records management as part of their larger IT infrastructures.

But this wasn't always the case. Most records management systems evolved as a set of utilities that met the needs of records managers only. The products did not need to integrate with other systems, and records managers often couldn't rely on IT support to implement and manage the systems. In fact, many records management systems were home-grown legacy systems, or simple box-and-folder inventory tracking systems.

Understandably, today's IT departments may not be equipped to support records management systems. Likewise, many records management systems are not designed to support your organization's information systems. These conditions have brought to light a number of technological issues that are having an impact on the RMS market. These issues include:

- ?? Evolution of IT Infrastructures
- ?? Explosion of new document formats
- ?? The inevitable EDMS integration
- ?? The Nets
- ?? The Year 2000 problem

Evolution of IT Infrastructures

There is a new IT reality. Organizations have made significant investments in far-reaching technologies such as operating systems, databases, intranets, e-mail and messaging environments. Records management technologies should be able to co-exist with these components, and should leverage the infrastructure that these components combine to create.

IT groups have a vested interest in ensuring that the technologies they use are compatible and conform to standards. IT is responsible for creating a stable and reliable environment, while at the same time reducing the total cost of administration and support. In addition, IT groups want to know that the products they choose have a strategic direction that matches their own – such as a commitment to all-Microsoft technologies, or a need to support mixed environments via an intranet infrastructure, or a desire to standardize all databases on Oracle.

Many of the vendors we evaluated in this study understand the new IT reality, and are taking varying steps to ensure that they become first-class IT citizens. For example:

- ?? Cuadra has recently introduced a Windows NT version of its STAR product (though we have not yet evaluated it)
- ?? EDUCOM is expanding its architecture to include integration with line-of-business applications, Lotus Notes, and workflow systems (through DOCS Open).
- ?? Information Network IN's InSight can use either a Microsoft Access or Microsoft SQL Server database, and provides a simple way to easily migrate from Access to SQL. InSight requires little or no IT support for smaller installations
- ?? PSSoftware's RIMS is reasonably well integrated with Windows NT, and the next release of RIMS will build on this. It will use NT's file management capabilities rather than having to be completely dependent on a third-party DM system like PC DOCS.
- ?? Provenance's declared strategy with Foremost is to become a toolkit or componentware that can integrate with any infrastructure

?? TOWER has just published its API with TRIM 4.2, and requires little or no IT support for smaller installations

Explosion of New Document Formats

Today's organizations are creating and receiving most of their information in electronic format. Countless documents are created and stored in electronic format. E-mail is the fastest growing area of discovery in corporate litigation today. Duplication and dissemination of electronic documents is extremely easy, and can lead to multiple versions and renditions of the same document – which means redundancy of information, which can be difficult to control.

By managing electronic documents as records, companies can bring the documents under organizational control and risk management. This means that an effective RMS must be able to handle records in electronic formats to help organizations practice proper records hygiene with their electronic records as well as their paper records. Ideally, RMS products can integrate with the applications with which users generate or receive electronic documents – productivity tools such as word processors, spreadsheets, and e-mail systems. RMS products should be able to gracefully accept attempts to declare records from these applications.

All the products we evaluated provide some means of managing electronic records, generally through one of two approaches. RMS products can manage electronic records directly, which requires the vendors to add these capabilities to their products. Or, RMS products can integrate with electronic document management systems (EDMS), and allow the EDMS to handle electronic records behind the scenes.

Electronic records present a new set of retention challenges. For cost-effective and secure storage and retention of electronic records, you'll need to consider different types of storage media such as magnetic, optical, CD, and magnetic tape. You will also need systems and hardware to manage your storage, including jukeboxes and hierarchical storage management (HSM) systems. You must also be prepared to migrate data as storage hardware and software systems become outdated or obsolete.

Electronic records present new legal challenges as well. For example, with electronic records it is difficult to prove authentication without electronic signatures or other complex and expensive solutions. And since electronic records management is so new, there is limited case law to cite – but that hasn't slowed attorneys from pursuing electronic documents in discovery.

The Inevitable EDMS Integration

Functionally, there is overlap between electronic document management systems (EDMS) and records management systems. But increasingly, EDMS functionality is creeping into the operating systems and desktop tools that users work with every day. Thus, your organization will soon have at least basic DM capabilities without ever buying an EDMS product.

Basic DM functionality includes “library services” such as version control, check-in and check-out, and so on. Such features are quickly becoming commodities. For example, Windows NT 5.0 will include such functionality. Microsoft Office products already include basic library services, although few organizations use them systematically. Primitive workflow functionality is also becoming commoditized – any e-mail or groupware system can use its messaging infrastructure for basic routing.

For EDMS products to survive in this climate, they must continue to provide significant value-add over and above what organizations can get for free in operating systems and desktop tools.

Beyond what is offered by the infrastructure vendors such as Microsoft, some EDMS vendors are now offering products that can easily and justifiably be deployed to literally almost every desktop of organizations. Two notable examples are Lotus Domino.Doc, which runs with Lotus Notes, and Open Text LiveLink, which runs in any Web browser and has been successfully deployed in installations with tens of thousands of seats.

What does this mean for the RMS industry? In the past, the RMS vendors had a reasonable argument for not making EDMS integration a high priority, because so few desktops used document management. This is changing, as operating systems and productivity tools alone will put at least basic DM on every desktop. Thus, EDMS integration is becoming a requirement for RMS products, and many are making strides. In fact, many RMS products rely on EDMS integration to manage electronic records.

More generally, EDMS integration is a good litmus test for RMS vendors. If a vendor does not even have a plausible *strategy* for such integration, it is conceivable that both the vendor and its customers are in for some rough times. Doing it right requires time and development cycles, which will put certain vendors (and their customers) behind the technology curve.

The Nets

The Web is becoming more than a data distribution and publishing medium. Organizations are starting to use it as a platform for business applications. Records management systems must support the way in which organizations use “the Nets” – the Internet, intranets, and extranets.

But what does “support for the Nets” mean? At a minimum, users must be able to declare, classify, search, request, and retrieve records via browser. Ideally, the system can also be administered via browser, allowing records managers to handle retention and disposition in a Web-based environment. Architecturally, the RMS should be able to handle the demands that Web-based applications can generate – including the ability to provide reliability and performance with increased volumes and demand spikes.

While the Web is great for application accessibility, it actually creates challenges for records management in terms of content. The Web easily crosses functional, geographical, and even organizational boundaries. Companies can readily share documents and collaborate with suppliers, customers, and partners. That means new documents circulating around the organization – documents that can potentially be managed as records.

In addition, content that is delivered via the Web can be dynamically composed from multiple files or repositories. For example, a human resources application may draw information from several repositories. The information presented to users may vary depending on the employee’s privileges, level within the firm, or even the time at which the information is accessed if the system delivers the most current information available.

All this means that Web pages can be built from a wide range of repositories, and they can contain more and different content, structure, and context than their paper counterparts (including embedded code). Thus, if Web content and pages are to be classified and managed as records, the records management system must be able to handle dynamic content and the potentially disparate repositories of the source material.

All of the products we evaluated have Net strategies. Most offer first-generation solutions, with the ability to search for records and to declare and classify via a browser. The vendors are quickly trying to move beyond basics to address the larger issues and opportunities that the Web creates.

The Year 2000 Problem

There are essentially two issues that the Year 2000 problem creates for the records management systems, the people who use them, and the vendors who provide them. First, many home-grown legacy RMS solutions are not Year-2000-compliant, and may have to be replaced with new systems. Second, with all of the other demands that the Year 2000 problems creates for IT groups, records management may receive little attention in many organizations.

Some legacy systems can't handle the date change from 1999 to 2000. Those legacy applications must be debugged and modified to work around the problem, or replaced with alternate applications. Most of the records management systems in use today are legacy systems, and are ripe for replacement. This creates a huge opportunity for RMS vendors, who can offer organizations new systems to handle current and future demands.

The Year 2000 problem is taking tremendous resources from corporate IT departments. Polls consistently cite the Year 2000 problems among the top three priorities of senior IT managers. This means that records management – already low on the IT priority list – will not be receiving a lot of attention from IT groups for the next year or more. This means that it is more important than ever that the RMS product you choose conforms with your IT standards, so it can be efficiently maintained by IT personnel – or better yet, be deployed, administered, and supported without IT support.

Changes in Customer Demands for Records Management

Clearly, customer demands and expectations regarding records management systems are changing. The traditional customers for RMS products – records managers – must now cope with the challenges brought by electronic documents.

At the same time, new classes of customers have emerged – each of which has its own set of demands. Besides the records managers themselves, the three new groups with specific demands for records management include:

- ?? End users
- ?? IT groups
- ?? The organization

New End User Requirements

The latest shift in records management is to give end users access to the RMS, and to allow them to participate in the records management process. Putting the RMS into the hands of business users can extend RMS benefits to people who formerly had no experience with records management.

Many organizations want to allow users to classify records, search for records, and submit retrieval requests – right from their desktops. Thus, users can make informed business decisions based on information in the records repository.

End users have their own set of needs. They need a simple and painless process for declaring a document an official record and classifying it (thus easing the burden of responsibility). They need both basic and sophisticated querying capabilities for searching the records and document repository. They may want to access the RMS from an interface other than the RMS client, such as a Web browser, an EDMS application, or productivity tools such as Microsoft Word or Lotus Notes.

End users have established expectations about the look and feel of the systems they use. For example, they expect the software they use to follow Windows interface standards. They expect navigation to be intuitive, with consistent interfaces. And they expect minimal training requirements.

In order to be viable for a broader class of users, RMS products need to be tailored for more general-purpose use. This means that the vendors must now pay attention to product characteristics that were formerly less important to a highly specialized user base. But end users aren't records managers, nor should they be expected to learn the discipline. Users will need simpler interfaces, fewer features, and easier ways to find the information they're looking for.

Vendors also need to understand the kinds of users they want to seduce, and provide the functionality that different types of users will need. For example, some companies might want to restrict users to searching the records repository. Other companies may want to give users more power, such as the ability to add information to the records repository. Vendors should be ready to cater to both – and in either case, new interfaces are required.

New IT Requirements

As records management gains acceptance as a strategic initiative, organizations will manage the RMS just as they would any other information management technology. Thus, IT groups will be evaluating RMS products with an eye toward cost of administration, ease of deployment, integration, and the ability to leverage existing technologies.

Specifically, IT groups want products that support their LANs and WANs, client/server environments, networks, messaging platforms, databases, intranets, and the Internet. They want to take advantage of the high-end hardware in which they have already invested. They want to ensure that the user community has reliable service and good performance. Finally, they want administration and maintenance to be as painless as possible.

New Organizational Requirements

As the organization rolls out records management to new classes of users, it does so with specific requirements in mind. The organization generally seeks to provide an accessible information repository that can be used to improve decision-making. It wants a system that is flexible enough to adapt to business process changes, making the system useful in changing business climates. And it wants to get a handle on the flood of new documents (particularly electronic), and involve users in the process.

But liability protection is still one of the overriding organizational requirements for records management. In today's litigious-minded society, organizations are more sensitive than ever to exposing themselves to potential lawsuits and legal actions. It is dangerous to have discrepancies between organizational policy and actual records management practice, or discrepancies between management of physical and electronic records. Such situations can expose companies to huge discovery scavenger hunts, costing millions of dollars.

RMS technology offers a great way for organizations to protect themselves by ensuring that records are retained in accordance with any industry regulations, available for retrieval, and disposed of when applicable. This is more important than ever, especially with the widespread use of e-mail. When organizations are sued, key people to be initially deposed are the e-mail administrators.

Changes in Regulations

Changes in regulations and standards are having a great impact on the records management industry. New regulations are forcing organizations (particularly government agencies) to implement new records management practices for records management, and to make new investments in technologies that meet the mandates of the new regulations. Technology standards are also playing a role (for more information on standards, refer to Section III, “About Records Management Technology”).

Two examples of RMS-related regulations for government agencies include DoD 5015.2 and GRS 20.

DoD 5015.2

This standard was developed by the U.S. Department of Defense, in cooperation with the U.S. National Archives and Records Administration (NARA). The standard specifies the capabilities that a records management application must have, and proposes a consistent guideline for application software products designed to manage records (primarily electronic records). In general, the standard covers the following areas:

- ?? Implementing a file plan
- ?? Filing electronic documents as records
- ?? E-mail collection
- ?? End user classification tools
- ?? Physical storage repository
- ?? Retrieval process
- ?? Security control
- ?? Retention/disposition screening process
- ?? Audit trails

The new standard mandates that all of the Department of Defense’s records management systems use products that have been certified in compliance with the DoD 5015.2 specification. In total, DoD 5015.2 includes 127 mandatory requirements, and 48 optional requirements.

The Defense Information Systems Agencies (DISA) is the body that performs the compliance certification. So far, RMS products from Provenance and TOWER Software have been certified as 5015.2-compliant.

There is another way to gain DISA's certification as DoD 5015.2-compliant: as a so-called "product pair." This certification is not for RMS products, but for document-oriented systems that can prove their integration with a DoD 5015.2-certified RMS product, and can perform a genuine product expunge (delete). At the time of this writing, systems from three vendors have been certified as product pairs (integrated solutions) with Provenance ForeMost: FileNET, Dyn Solutions, and USI.

GRS 20

The second regulation, General Records Schedule 20 (GRS 20), is a two-year-old NARA regulation that was recently overturned in a controversial court ruling. The rescinding of this regulation paves the way for agencies to start managing electronic records in the same fashion as paper records.

The original GRS 20 regulation considered physical (usually paper) records as the only viable medium. Thus, agencies could destroy e-mail and word processing files once they had been copied to paper or other physical format and deemed "no longer needed for updating and revision."

While GRS 20 drew a distinction between paper and electronic records, the courts determined that important electronic documents should be managed as records in the same fashion as important paper documents. According to the judge's ruling, "Computers have now become a significant part of the way the federal government conducts its business. The federal government must adapt its electronic record-keeping capability to reflect that reality."

At a minimum, this means that the government must distinguish between valuable and useless electronic documents, and perform systematic retention and disposition on electronic records. This effort requires procedural and technological changes. It requires adequate records and document management for both paper and electronic records. The result will be major changes in the needs of records personnel, IT staff, and end users who are not records managers.

Changes in the Competitive Landscape

In the face of changing technology, customer needs, and other market forces, the vendors are responding in a number of ways. RMS vendors are rapidly changing their products to meet new demands. Some EDMS vendors are partnering with RMS vendors, while other EDMS vendors are encroaching on the records management space.

This section discusses how RMS vendors and EDMS vendors are responding to the current climate in the records management industry – both as competitors and as complementers.

RMS Vendors

Thanks to the rapid changes in document types, user demands, and regulations, many of the RMS systems in use today fall short of meeting all of an organization's needs. Many RMS systems currently in use are home-grown solutions or older systems based on legacy technologies, woefully outdated for the new requirements of records management.

The RMS vendors are adopting a number of different strategies, many of which are reminiscent of the strategies pursued by the DM vendors over the past few years. For example,

- ?? Some RMS vendors are doing nothing different at all
- ?? Some RMS vendors are trying to be all things to all people, while others are trying to specialize
- ?? Some RMS vendors are trying to incorporate new capabilities (such as electronic records management), while other RMS vendors are trying to integrate with other products that provide new capabilities (such as DM products)
- ?? Some RMS vendors are positioning their products as turnkey stand-alone solutions, while others are offering componentware or toolkits

Vendors will experience varying levels of success with each of these approaches. Depending on your application requirements, one approach might make more sense than another.

But on a larger scale, it is possible to categorize products into four different broad classes, based on their adequacy for enterprise records management, both now and in the future. The product classes are:

1. Products that meet enterprise records management requirements today, and are likely to continue to meet those requirements in the future.
2. Products that are adequate for records management today, but will likely be inadequate in the future.
3. Products that do not meet enterprise records management needs today, but will likely meet those needs in the future.
4. Products that do not meet enterprise records management needs today, and will not meet those needs in the future

The following table summarizes the characteristics of each product class.

Product Class	Example	Description
1. Meets enterprise records management requirements today; will likely meet those requirements in the future	Established enterprise RMS vendors with strong IT strategies	These established vendors are a good buy for today and for the future. They have experience in records management, and they also have a solid IT strategy that involves EDMS and the Internet.
2. Adequate for records management today; likely inadequate in the future	Legacy records management products	These products typically met the needs of organizations when first acquired (usually for paper-based records). However, they are inadequate for managing electronic records, they do not scale well, and they do not integrate well with EDMS.
3. Do not meet enterprise records management needs today; will likely meet those needs in the future	The newcomers to records management	These vendors will be interesting to watch. They may lack records management experience and key features that seasoned records managers require. But these vendors provide excellent IT and EDMS strategies, and the records management functionality is likely to follow.
4. Does not meet enterprise records management needs today; will not meet those needs in the future	Stand-alone or low-end client/server RMS products	Such systems do not scale well and do not integrate well with enterprise EDMS systems.

Table 2 – Classes of RMS Products

EDMS Vendors

In the past, RMS vendors initiated the integrations with the EDMS vendors, largely because they found they could leverage such systems for electronic records management. Thus, a number of different RMS vendors provide integration with systems from major DM vendors like PC DOCS and FileNET. But more recently, the EDMS vendors are beginning to take initiative in integrating with RMS products (as evidenced by FileNET's recent DoD compatibility certification as a product pair with Provenance Foremost).

Sophisticated records users have even started clamoring for mainstream EDMS vendors to build records management functionality into their architectures and object models – and it is starting to happen. Documentum's new EDMS 98 includes "Records Management Services," which are based on a new EDMS automation agent for records migration. As of this writing, Documentum is the only solutions provider (besides TOWER Software) to incorporate document retirement into a common enterprise repository architecture, rather than in a separate records system.

We expect other EDMS vendors to follow suit. For example, Identitech currently provides basic RM functionality through its FYI toolkit. NovaSoft's DM system already provides the ability to track physical documents. Such vendors are prime candidates to extend their RMS functionality.

Interesting things are also taking place with the EDMS support layer – input systems, output systems, and storage systems. For example, some near-line storage vendors are incorporating the ability to destroy files on CD and optical disk – a capability that most RMS products lack.

In addition, near-line storage vendors such as Diamond Head Software and SMS (via partnership with Smart Storage) are adding e-mail storage management capabilities. Users send e-mail to the jukebox management software, which burns it on CD. The software can organize and track messages so they can be easily retrieved, retained, and destroyed. RMS products may soon leverage such capabilities.

III. ABOUT RECORDS MANAGEMENT TECHNOLOGY

This section discusses a number of technical issues that are important to understand before implementing an RMS. They are the cause of much confusion in the industry. They are:

- ?? Enterprise requirements for records management
- ?? Architectural design approaches
- ?? Two-tier vs. three-tier architectures
- ?? Databases and repositories
- ?? Integration with EDMS and other applications
- ?? Standards

Enterprise Requirements for Records Management

Almost all vendors involved in information management, whether they are in DM, workflow, or records management, contend that their systems are built “for the enterprise.” But what exactly does “enterprise” mean? This is a confusing issue, one that’s very important to untangle.

Vendors used to talk about enterprise in the context of a large number of seats. But if you’re looking at enterprise today, you’re probably looking for more. You probably want every person in your organization to have access to the RMS and the same logical repository – even if your people or offices are in different geographical areas. You want the ability to tie the system to your existing business systems. You want deployment and maintenance to be as painless as possible. You want your IT staff to be able to leverage their existing skills in managing the system. And you want the system to be highly reliable and available.

This is important when looking at records management products. It’s one thing to provide a system that only needs to support a handful of records managers within an organization. It’s quite another to be able to support potentially thousands of users on different platforms who want to connect with the RMS and query the database for information. Thus, the vendors must ensure that their products can scale to support a different kind of usage.

In general, when thinking about which products might match your own enterprise requirements, think about the following criteria:

- ?? Number of users
- ?? Number of transactions
- ?? Record volumes
- ?? Distribution requirements
- ?? Application integration requirements
- ?? Leverage supporting infrastructure
- ?? Administration and management issues

Number of Users

It is important to understand how many users you need your RMS to support. Vendors sometimes talk about scalability in terms of the number of seats installed. Other vendors use concurrency as the measure, indicating the maximum number of users that can be connected to the system at same time.

The better RM products distinguish between RM coordinators, contributors, and consumers – and offer functionality and pricing to match. Coordinators perform the RM administrative functions like creating and maintaining the file plan. Contributors can declare and classify records, as well as search for, retrieve, and request records. Consumers typically can just search for, retrieve, and request records.

The ratio of records managers to non-records managers is often estimated at around 1 records manager to 100-300 non-managers, with commercial organizations having a higher ratio of non-records managers than government organizations. In general, we expect the numbers of contributors and consumers to greatly increase in the next few years, as messaging systems and the Web make it easier for non-records managers to participate in the records management process.

Number of Transactions

Records management for the enterprise requires the capacity to handle a large number of transactions. Even though records management is not usually considered a transaction-intensive application today, as more and more users gain access to the records management system, transaction volumes will continue to increase.

The question is, how many transactions will typical users make? One reasonable estimate is that end users should declare as a record one of every ten e-mails or word processing documents they produce. This will vary across industries and applications. For example, organizations such as the military may require that every single document be declared a record, with a default minimal retention period.

Record Volumes

This is the requirement that a system be able to manage large volumes of electronic or physical records. The ability of a system to handle large record volumes is distinct from the ability to handle transaction volumes, but it is determined by many of the same factors (such as the type of database).

For example, extremely large volumes of records typically associated with enterprise RM require a database that can handle the volumes with acceptable integrity. This may require a SQL database, or high-performance flat-file database.

Distribution Requirements

Enterprise applications are typically distributed, both logically and physically. This means that enterprise applications often cross organizational and functional boundaries. They may involve multiple business units, such as Research and Development, Manufacturing, Legal, Marketing, and Sales. These departments may be physically distributed, such as across buildings or even across time zones in different cities.

The nature of enterprise applications places obvious requirements on the hardware and software systems involved. Performance must be acceptable, and replication may be required to give users access to the database locally. In addition, the system must be able to support certain kinds of functionality in a distributed environment, such as the ability to file and classify from any location. For many organizations, a Web-based approach is a practical necessity for performing RM in a distributed environment.

While some RMS deployments are for departmental or smaller-scale implementations, many organizations require the flexibility to use the system on an enterprise scale, perhaps for multiple departments.

Application Integration Requirements

Integration requirements arise at multiple levels. At a minimum, the RMS should integrate with an organization's existing infrastructure components. These may include the pervasive document-producing applications (such as Microsoft Office) and e-mail systems (such as Microsoft Outlook and Lotus Notes).

At a more advanced level, the RMS may need to integrate with document systems, such as DM and possibly imaging and workflow. At the highest level, the RMS may need to integrate with the other information systems in the organization, such as legacy line-of-business applications (such as mainframe systems) and enterprise resource planning systems (such as those from SAP or PeopleSoft).

Leverage Supporting Infrastructure

The enterprise RM application should share the resources of the organization. This implies that the RM application should also be compliant with major standards. The RMS should make direct use of common hardware and software such as servers, jukeboxes, scanners and operating environments. It should support common development and support tools such as Java and ActiveX. It should support common databases such as Oracle and Microsoft SQL Server. And it should take advantage of the people and expertise within the organization.

Administration and Management Issues

Even with an RMS that is enterprise-ready in all other areas, challenges may exist in terms of system management and training. For starters, many organizations underestimate the time and cost associated with deployment. RMS products are not shrink-wrapped solutions, and some degree of customization and integration will be required.

Likewise, maintenance and support are issues that organizations must plan for. RMS software can make things easier by integrating with the operating system utilities, but all systems will require maintenance at some level. System monitoring, change management, and software updates must be managed systematically in order to provide acceptable service and support to the user base.

Keep in mind that electronic records management is still a maturing industry – if you are managing electronic records, much of what you are doing is new. Your IT staff, your integrators, and even your vendors may need extra time to come up to speed on the nuances of electronic records management.

One of the largest potential hurdles for organizations is a lack of enterprise focus in general. Many companies have not yet introduced a unified network infrastructure or standardized enterprise environment – which may make “enterprise RMS” a moot point.

Likewise, RMS practices are not likely to be in place throughout the enterprise. Some organizations may even face resistance as they try to roll out the RMS to previously autonomous departments or users. Common instinct is to resist change, particularly one that imposes new work paradigms. Users will need time to understand the value of enterprise RMS, and to learn how to effectively use the tools to support the company goals. This, too, can be challenging, as different users have different skill sets, responsibilities, usage models, and delivery environments.

Architectural Design Approaches

There are three basic high-level architectural approaches that can be used in document-centric systems such as DM and RMS products. Each design enables different levels of functionality, integration, and scalability.

It is critical to understand these approaches for two reasons. First, the RMS you choose will use one of these designs, and it is important to be sure the approach makes sense in your environment. Second, if you're going to integrate your RMS with a DM system, the DM system will also use one of these designs.

The three basic design approaches that characterize the architectural approach that DM products and RM products can use are:

- ?? Client/server-based systems
- ?? Web-based systems
- ?? Groupware-based systems

The following table summarizes the key characteristics of each approach:

Design	Characteristics
Client/server-based	?? Stand-alone; provides a new infrastructure and interface ?? Uses a separate relational database to store metadata ?? Independent of other systems (i.e. groupware or intranet rollout will not affect the system) ?? Scalability can be limited, depending on architecture
Web-based	?? Browser-based interface, providing ubiquity – users can access records from any location ?? Web-based applications are platform-independent ?? Deployment is simple – clients do not need software
Groupware-based	?? Tightly integrated with existing messaging infrastructure, leverages its scalability ?? Typically uses groupware system to store metadata ?? Seems like part of the infrastructure to both users and administrators ?? Relies on a successful groupware deployment ?? Some DM tools use this approach today, but no RMS tools

Table 3 – General Design Approaches for Document-Oriented Systems

Client/Server-Based Systems

Client/server-based systems are the traditional approach for DM and records management products. These systems are characterized by a client application that provides users with system functionality and access to the repository. The documents are typically stored in a shared network drive, while metadata is stored in a database. All document access is controlled through the database.

The following are key characteristics of client/server-based systems.

- ?? Traditional client/server systems are dominant desktop applications with their own set of features (often far more than the average user needs on a regular basis). The software requires considerable time and effort to learn. Because of this, organizations need a highly compelling business reason to invest in the technology.
- ?? Client/server systems typically require a separate database, usually a relational database such as Oracle, Informix, or Microsoft SQL Server. This may mean additional cost and administrative effort, unless you already have such databases (and database administration expertise) in-house.
- ?? Because of the cost and administrative effort associated with client/server-based systems, organizations have tended to give document management or records management only to users who really need it (e.g. departments within an organization, rather than deploying across the organization as a whole).
- ?? Traditional client/server-based software tends to be expensive, costing several hundred dollars per seat. Together with a relational database, integration costs, and custom development fees, enterprise-wide deployment costs can be prohibitive to many organizations.

Web-Based Systems

Web-based systems provide a number of key advantages. Because Web browsers are ubiquitous, Web-enabled systems can provide users with controlled access to corporate document stores or records stores via the Internet, intranets, and extranets. As a result, corporate users can add or access information from any location. Companies can also share access to certain documents with users outside the organization, such as customers or suppliers.

Web browsers and Web-based applications are platform-independent, so it does not matter which client operating system is used. The Web's thin-client computing paradigm means easier rollouts and reduced administration for client workstations. Finally, the emergence of advanced technologies such as ActiveX and Java applets allows vendors and application developers to develop robust interfaces that are comparable to client/server interfaces.

Most vendors with traditional client/server systems have added Web-based access to their core offerings. In many cases, the browser-based interfaces provide only basic functions, such as searching and viewing. But some vendors provide Web-based interfaces that provide complete functional parity with their core client/server offerings.

From an administration standpoint, Web-based systems are simple to roll out, because no client software is required. In addition, ongoing administration and support is simplified, as software updates only need to be made on the server.

Most installations will involve a mix of client/server users and browser users. Because browser-based clients typically have a lower cost than full-fledged networked clients, organizations can increase the size of their deployments in a more economical fashion.

Groupware-Based Systems

Groupware- or messaging-based systems represent a strong step in the evolution of document-oriented systems into mainstream applications. While no RMS products have yet taken this approach, several DM products are now available for use within groupware environments such as Microsoft Exchange and Lotus Notes.

Groupware-based systems use the messaging infrastructure as the application framework. Profile information is stored within the groupware system itself, such as in Lotus Notes databases or Microsoft Exchange Public Folders. Documents can be delivered and distributed via messaging. Groupware-based systems enjoy the same scalability as the groupware systems themselves, which use a messaging-based architecture that is designed to support thousands of seats in an enterprise.

Usability is simplified, as users can access the system directly from their groupware clients. To users, this makes the system feel like part of the infrastructure they use every day.

Life is simplified for administrators, as well. Groupware-based systems leverage the name and address books of the groupware systems, which means users do not have to be created and maintained just for the document system. Everyone with a groupware account can have access to the document system. There is no third-party database to manage. And as groupware systems add new capabilities (such as collaboration, integration with operating systems, and Internet capabilities), groupware-based systems can leverage them.

Groupware-based systems are also highly effective for categorizing and managing e-mail messages. In most organizations, e-mail is used for exchanging business-critical information. Groupware-based DM systems allow users to store and profile e-mail messages within the DM system.

While the groupware-based design has advantages, few products in the document management space use this approach – and none in the records management market. In addition, there is some question as to the trustworthiness of groupware systems as a repository for managing critical business records that are subject to regulatory requirements.

A Word about Two-Tier and Three-Tier Architectures

System architectures are changing. All of the RMS products we evaluated currently use two-tier architectures. But many products in the larger EDMS market (particularly DM systems) are moving to three-tier architectures. What are the pros and cons of each?

Two-tier architectures consist of only two components: the database server and connected clients. Most of the processing takes place on the client. In addition, the client connects directly to the database, which requires that database drivers be installed on the client machine. For these reasons, two-tier architectures are often referred to as “fat-client” systems.

Two-tier systems provide some advantages. The architecture is simple, and it is proven to work. Users can search multiple databases, and have the client combine and prioritize the results into a single hit list. Users have full system functionality available even if they are not connected with the main system – an ideal scenario for disconnected or mobile users.

But two-tier systems have drawbacks, too. Because all processing and database connectivity takes place on the client, organizations may have to invest in high-powered workstations in order to have good performance. Upgrading the client software can be resource-intensive, as the software must be upgraded on every single user’s desktop.

Two-tier systems can also be difficult to scale in large distributed systems. In a two-tier configuration, each client requires its own database connection, and it is difficult to maintain a large number of connections to multiple databases.

A few years ago, the first three-tier architectures were introduced as a way to address these limitations. Three-tier systems add a middle server layer that handles most of the system processing.

Consider the advantages that three-tier architectures provide:

- ?? The central server is the middle tier that acts as a broker between the client and the server, managing database connections for the clients. This enables more efficient connections for multiple users, and it means that clients no longer require database drivers installed on their machines.
- ?? The server handles heavy processing that can bog down client workstations. Since most of the application code resides on the server, less software is required on client machines, simplifying upgrades and requiring less processing power on the desktop.
- ?? The central server can distribute client requests to other servers. This enables the server to balance the processing load across multiple servers. Thus, three-tier systems can provide optimized performance while adding enterprise capabilities such as fault tolerance.

However, the real advantage of the three-tier configuration is Web-readiness. Two-tier, fat-client systems are too difficult to manage in an intranet paradigm where thin clients or zero-administration clients are the norm.

With three-tier systems, users simply connect to the middle server layer via a browser, through a Web server. Users can run HTML-based interfaces, or the server can download Java applets or ActiveX controls to users for execution on the client. This simplifies system upgrades, as software only needs to be updated on the server.

The Web is a key requirement for organizations that want to give their users access to the RMS from any desktop, anywhere, without requiring client software. Systems with two-tier architectures must be redesigned to accommodate Web users, whereas three-tier systems only need to build a browser interface and handle connectivity issues.

Repositories and Databases for Electronic RMS

This section highlights the different repository approaches and database approaches that RMS products can use for storing electronic records.

Repository Approaches

In discussions of document-oriented systems, the term “repository” typically (and vaguely) refers to both the document store itself, as well as a database that stores metadata (index or profile information) and information about the actual location of the documents.

There are three basic approaches to repository architectures that RM vendors take for electronic records management, and they have significant impact on the functionality they can provide. The three approaches are:

?? No captive document store approach

In this approach, electronic documents reside wherever they would reside normally (on a desktop PC or file server); the RMS stores metadata, but has no control over the actual documents

?? RM repository approach

Electronic records are physically added to a repository that is directly managed by the RMS.

?? DM repository approach

Electronic records are physically added to a repository that is directly managed by a DM system.

This section briefly outlines each approach.

No Captive Document Store

This is the most basic approach for managing electronic records. In this approach, the RMS captures metadata from the source application (such as Microsoft Word) and adds it to the RMS database.

However, the RMS has no control over the actual documents. Electronic documents are stored in the same location they would be stored even

without an RMS – usually a network drive. Thus, the RMS has no control over unauthorized access or tampering with the documents.

This is the most basic approach. It provides only records tracking or inventory ability; it is thus the electronic counterpart of systems that track or keep inventory of physical records on shelves. Most currently installed electronic records management systems are probably of this variety, being home-grown or custom integrations.

RM Repository Approach

In this approach, metadata is captured from the source application into the RM database, and retention is applied. The document itself is placed in the RM repository, over which the RMS has direct control.

This is the approach taken by Cuadra, IN, Provenance, and TOWER. Provenance also allows the option of storing documents in a DM repository (the third approach), and can later migrate them to the RM repository.

DM Repository Approach

In this approach, records management data is entered through the DM system's profile screen, and the document is added to the DM system's repository. However, the RMS controls the records in the DM repository, and can apply retention to them.

This is the approach taken by EDUCOM and PSSoftware, which currently require integration with a DM system in order to handle electronic records. EDUCOM uses PC DOCS to manage electronic documents, while PSSoftware requires either PC DOCS or FileNET. Provenance also uses this approach, although it can alternatively add electronic records to its own repository.

Database Approaches

There are several common database approaches that RMS vendors can take, and each has advantages and disadvantages. The most common database approaches are:

?? Relational database

Relational databases like Oracle, Sybase, and Microsoft SQL Server offer robust SQL searching capabilities, accessibility, and ODBC compliance.

?? Proprietary database

Proprietary databases using a sequential or hierarchical approach can offer fast performance and simplified management. Such databases are usually optimized for the requirements and demands of the RMS product. However, they may not support access from outside queries.

So which database approach is best? Clearly, it depends on your application requirements, and the way in which a given vendor has implemented its database approach. For example, if accessibility is critical, you may want to look closely at products that use open relational databases. If performance is more critical, you may want to look closely at products with proprietary databases, or relational-based products that have devised ways to address performance limitations.

Relational Database

Relational databases like Oracle, Sybase, and Microsoft SQL Server offer robust SQL searching capabilities and ODBC compliance. Such databases are easily accessible, allowing users to form their own searches across any number of records. This makes the data more accessible for data mining applications. In addition, relational databases do not restrict users to the RM product's user interface and query language for extracting index data.

EDUCOM, IN, Provenance, PSSoftware, and TOWER all offer systems with relational databases.

Proprietary Database

Products that offer their own proprietary databases can optimize the database for the particular demands and requirements of the RMS. Proprietary databases using a sequential or hierarchical approach offer fast performance and can handle large records databases with many indexes. In addition, a proprietary database means you don't need a third-party relational database, and you don't need a database administrator to manage it.

However, proprietary databases may not support access from outside queries, which could limit a user's ability to search across records. And if your vendor goes out of business, getting data out of the system could be a challenge. But if you will always access your data via the RMS itself, this issue is not a limitation.

Cuadra offers a proprietary database, and cites among its virtues its ability to handle hierarchical relationships easily. They alleviate the difficulties commonly associated with proprietary databases by offering translatability.

Integration with EDMS and Other Applications

As organizations begin managing their electronic documents as corporate records, vendors of RMS products must respond by offering the ability to manage electronic records.

Some RMS vendors have chosen to add basic functionality for electronic records management. Other vendors have opted to provide integration points with DM systems and EDMS infrastructures. EDMS products can include technologies such as DM, imaging, workflow, and computer output to laser disk (COLD).

Clearly, EDMS products provide mature functionality for handling electronic files, and RMS products can leverage these capabilities. Many organizations already have existing investments in EDMS technologies, so it make sense from an IT perspective to integrate the RMS with the EDMS layer. From a usability standpoint, users will want to have the RMS seem like a part of the existing EDMS infrastructure that they are already using.

In addition, users will expect the RMS to integrate seamlessly with the other applications they already use. This could include desktop productivity tools (word processors, spreadsheet programs, etc.), as well as line-of-business applications such as accounting systems or SAP applications.

For all of these reasons, it is critical that RMS vendors offer open interfaces to allow developers to integrate the products with existing systems. Options include C-level APIs, higher-level interfaces such as OCXs and Visual Basic controls, and even macro-level integration with desktop applications.

Another way to make applications easier to use is to integrate them directly into the operating system. For example, several new DM systems provide Windows NT shell integration – the repository appears as a logical drive in the file system, so users can access the repository straight from their Windows Explorer or Windows desktop applications. This is a compelling way to make the repository transparent to the user. However, none of the RMS products we've seen currently offer this level of integration.

Opportunities for Integrated Solutions

Clearly, there is some functional overlap with records management and DM, and even with productivity suites such as Microsoft Office. However, there are certain key functions that only one type of product can provide. Therefore, in many cases it may make sense to integrate the various technologies to create a more seamless environment for users.

The following table shows some of the functions each system typically provides.

Functions	Office Suites	DM	RMS
Administration			
Document access security		YES	YES
Rights management			YES
Capture/Create			
Document import/export		YES	
Image capture		YES	
Index/Organize			
Uniform classification			YES
Retention citations/scheduling			YES
Store			
Document migration		YES	
Archiving			YES
Retrieve			
Store/retrieve metadata		YES	YES
Searching metadata		YES	YES
Store/retrieve content	YES	YES	YES
Searching content	YES	YES	
Process/Edit			
Version control	Via API	YES	YES
Check in/out	YES	YES	
Document viewing	YES	YES	
Document annotation	YES	YES	
Document editing	YES	Via API	

Table 4 – Functionality of Productivity Suites, DM, and RMS

EDMS and RM technologies often coexist in the same environment for different reasons. Each was created to solve separate but overlapping needs. There is currently no “suite” of combined records management and EDMS solutions. Most DM vendors don’t offer records management functionality native to their offerings. Unless your EDMS system has some specific RMS functionality built-in, the two systems will have to be integrated.

Because RMS and EDMS technologies are so naturally complementary, users should plan a strategy that incorporates both. Using an RMS that integrates with EDMS will require fewer resources, provide better application functionality (records management functionality) and leverage vendor strength. Keep in mind that these technologies provide different benefits to different classes of users.

The following table summarizes the benefits that integrated EDMS and RMS can bring to different groups within an organization.

Group	Benefit of Integrated EDMS and RMS
Records manager	<p>?? Single point of control for all information classified as records (whether electronic or paper)</p> <p>?? Compliance with government or industry regulations</p>
End user (non-records users)	<p>?? Single system for managing information (both paper and electronic, requiring that the user put the document into the system once)</p> <p>?? Better usability, improved retrieval, and a richer repository</p>
Management	<p>?? Reduces costs associated with retrieving information and a failure to retain records</p> <p>?? Reduces risk, as formal retention and disposition practices protects against potential litigation</p> <p>?? Increases productivity, as information is accessible to everyone and easier to find</p>
IT	<p>?? Less resource-intensive to manage than multiple systems (for EDMS and RMS)</p> <p>?? Optimal utilization of storage resources</p> <p>?? Vendor stability: those RMS vendors without an EDMS strategy are in for a rough future</p>

Table 5 – Benefits of Integrated EDMS and RMS

Technology Standards

A number of different technology standards are impacting the records management marketplace. Some standards come from industry consortiums, and others are *de facto* standards from vendors such as Sun and Microsoft. The standards include those for databases, security, the Internet, distributed object models, and inter-system standards for EDMS.

Database Standards

Database standards include Open Database Connectivity (ODBC), Structured Query Language (SQL), and OLE DB.

ODBC is the major standard for database connection and communication. ODBC gives software application developers the ability to write to a standard interface for all back-end database platforms. Thus, any ODBC-compliant application should be able to use an ODBC-compliant database.

SQL (structured query language) is a well-established standard for database access and data extraction. SQL queries provide a common way to search for data in any relational database.

OLE DB (Object Linking and Embedding – Database) is a Microsoft standard that provides an OLE interface that applications can use to access multiple data sources.

Security Standards

One of the most frequently requested security models is the native operating system security, such as Windows NT Security. Unlike the mainframe environment, in which third-party packages are required, Windows NT-oriented applications can leverage the operating system's tools and user/group/role structure in the Windows NT domain.

Applications that leverage Windows NT security minimize the administration effort, particularly for organizations with thousands of users and many user groups that change frequently. Application security can be synchronized with the Windows NT domain so that when users move from one department to another, their new security is reflected in the application as soon as the network security is changed.

ADS (Active Directory Services) is one of the most important new features of Windows NT 5.0, which extends the Windows NT security model to a broader level. Instead of managing the security at the application level, now all the components within the systems, such as users, groups, files can be managed as objects in a distributed environment.

As the Internet becomes a more pervasive delivery mechanism for information, security standards become critical to the success of a solution. A particularly significant Internet-based security access standard is Lightweight Directory Access Protocol (LDAP). This protocol allows clients via TCP/IP to search and manage data in other systems that use LDAP-compliant directory services. Thus, any client that is LDAP-compliant should be able to seamlessly access other LDAP-compliant systems. Active Directory in Windows NT 5.0 supports LDAP.

Secure Sockets Layer (SSL) is a common Internet security protocol. SSL creates a layer on top of an existing connection-oriented transport protocols such as TCP/IP. SSL creates a session with a remote host and establishes if a user is valid. Once this is completed, a secure session is established. During the secure session, data from the client is encrypted or authenticated, while data received from a server is decrypted and verified.

Kerberos is a ticket-based security protocol. When a client logs on to the network, it logs on to the Key Distribution Center and receives a session ticket which is valid for a certain period of time or until the session ends. As long as the client has a valid session ticket, it can connect to all the servers for which the client has rights. This approach minimizes the number of authentications a client has to make. Windows NT 5.0 will be embracing this technology in its own security model. Thus, RMS products that move towards the Windows NT 5.0 security structure can leverage these capabilities.

Public Keys and Private Keys are used to encrypt and decrypt data. Public key performs the encryption, and is available for all applications. Private key resides in the client only, and it is used to decrypt data that has been encrypted with the associated public key. If the server sends encrypted information to the client, it will encrypt the data with the client's public key. However, the server or other clients cannot decrypt this data even if they intercept the message, because the correct private key is required.

Internet Standards

There are a whole host of Internet-oriented standards, and it seems like new ones are emerging every day. Keeping up with such standards is a constant challenge for RMS vendors. Some of the more significant Internet standards include HTML, DHTML, CGI, and XML.

HyperText Markup Language (HTML) is the default standard for Web page presentation. HTML is a markup language that uses data tags to specify the presentation of the Web page. Newer technology such as JavaBeans or ActiveX controls can be embedded in HTML pages to deliver a richer, more interactive interface that regular HTML pages lack.

Dynamic HTML (DHTML) is an extension of HTML. In DHTML, the data tags themselves are programmable objects, allowing the developer to make changes to any object or element on a Web page dynamically without saving code.

Common Gateway Interface (CGI) is an interface standard that executes logic in Web-based applications. Basic HTML and CGI scripts have been the common standards that most Web sites use, and many Webmasters and developers are familiar with these technologies.

However, HTML and CGI are not designed for transaction-oriented applications. With these technologies, new pages must be loaded every time a script is invoked, and CGI cannot maintain session context. More advanced programming approaches (such as ActiveX and Java scripts) are offering developers a way to create more robust application interfaces with more sophisticated processing.

Extensible Markup Language (XML) is an emerging standard that provides an industry-standard way for exchanging metadata embedded in Web pages. XML is a markup language that allows standard data fields to be contained within Web pages, and the data can be freely exchanged across applications. Initially proposed by the World Wide Web Consortium (W3C), XML is supported by vendors including Microsoft, Inso, and DataChannel. Security control can be applied even when the document is outside of the system's security control.

Distributed Object Model Standards

The two major distributed object models today are Common Object Request Broker Architecture (CORBA) and Component Object Model (COM). Such distributed object models are gaining momentum because of the obvious advantages they offer.

Distributed object models facilitate the re-use of code and modules, reducing much of the low-level programming typically required for customization. In addition, products that use an object model provide an industry-standard means of integrating with third-party systems and applications.

CORBA was created by a group of industry leading organizations called the Object Management Group (OMG). CORBA provides a programming framework that includes a standard Interface Definition Language (IDL) and Application Programming Interface (API). CORBA architectures use platform-independent ORBs (Object Request Brokers) as the standard interface between objects. ORBs simplify the process of making requests and servicing requests among objects in a heterogeneous environment.

COM, like CORBA, is a clearly-defined component software model, but it was developed by Microsoft. COM comprises a majority of the underlying structures used in Microsoft applications such as Windows 95 and NT. COM is the basis for such Microsoft “standards” as DCOM (Distributed Component Object Model) and ActiveX controls.

DCOM (Dynamic COM) is essentially an extension of COM that enables ActiveX-based components to communicate between one another across a network. These objects can be created using popular programming languages such as C++ or Visual Basic. Since many organizations have invested resources in developing internal COM-based applications, it is important for RMS and EDMS vendors to provide a clear path for these organizations.

Recently, Microsoft announced plans for COM+, an extension to the COM model. COM+ builds on COM’s integrated services and features, with includes added functions for database access and support for Microsoft back-end services such as transaction services, message queuing, security, and load balancing.

Inter-Business System Standards for EDMS

The recent trends of product integration and company mergers have created a need for application interfaces that allow different EDMS products to communicate with each other and share repositories. Such inter-business system standards for EDMS include Workflow Management Coalition (WfMC), Simple Workflow Access Protocol (SWAP), Document Management Alliance (DMA), and Open Document Management API (ODMA).

The Workflow Management Coalition is a non-profit organization that promotes interoperability among workflow systems. The WfMC standards include terminology, interoperability and connectivity between products. WfMC is being adopted by several vendors, including include Action Technologies, Computron, DST Systems, FileNET, IBM, and Staffware.

SWAP is essentially a Web-centric version of a workflow object model submitted by the Workflow Management Coalition. Over 20 vendors support this standard, including Fujitsu, HP and Sun.

The DMA specification is an interface standard that enables DM systems from different vendors to interoperate. After more than two years of development and testing, the 1.0 specification was approved in late 1997. DMA members are beginning to implement the standard into their products, and DMA-compliant products are scheduled to begin delivery in 1998. Although there has been little user demand for DMA thus far, RMS products should be DMA-aware in order to simplify EDMS integration.

ODMA is designed to provide interoperability between applications at the client desktop and back end repositories. ODMA provides a consistent interface to integrate client applications seamlessly with DM and RM systems. However, it also relies on the desktop productivity tools such as Microsoft Office to provide ODMA support. The ODMA standard also makes sense for the workflow market, and would allow users to participate in workflows directly through their desktop productivity tools

Managing the Risk of Risk Management

One of the primary purposes of RM is to manage the risk and cost entailed by your organization's information (as embodied in physical and electronic form). Likewise, one of the primary purposes of this report is to help you manage the risk of such risk management.

Evaluating, selecting and implementing a records management solution today is indeed a risky business. There are numerous business and legal issues involved, and organizations must take great care when developing a file plan, deciding which documents should be declared as records and which type of records. There are numerous technological issues involved as well, and organizations don't want to pay the price of making a poor technology choice that winds up falling short of expectations or requirements.

Why RM is So Risky

There are plenty of reasons why records management is so risky. The first reason is because of *what* you must now manage – electronic documents as well as physical records. Electronic documents that require appropriate records oversight include word processing documents, images, e-mail, and Web content. Physical records include paper documents, file folders, boxes, and the media of electronic documents (disks, tapes, film, and so on). If you don't effectively manage both, your RM initiative is at risk of failure.

Second, records management today is risky because of *how* you must manage the records in your organization. Due to the increase in electronic documents, you must involve the creators of records in the records submission and declaration process. This can open up almost the entire organization to the records management process. Thus, the success of your project depends on your users' acceptance and effective participation. Without it, your records management initiative is at risk of failure.

Third, records management is risky because organizations must now think of their RMS products as information management systems (if they didn't before). Therefore, RMS products must be first class IT citizens. They must be easily and effectively deployed, administered, and supported. Otherwise, your records management initiative is at risk of failure.

The final risk associated with RM is the risk associated with deploying new technology. Obviously, we all want to manage and minimize the risks associated with new systems, right from the start. Keys to managing risk of the deployment are effective project management, a corporate culture that is receptive to the change, and the selection of the right technology or product.

We've seen many organizations with good management and receptive cultures, but whose projects have failed because of poor technology choices. Why do such companies end up with the wrong solutions? All too often, it's because the organization did not properly assess their needs, and did not properly evaluate how well the product would meet those needs.

Measurement is the Key

The problem of selecting the right technologies is one of measurement: you must accurately measure your own needs, and accurately measure what a given product can do for you. In *Assessment and Control of Software Risks* (Yourdon Press, 1994), Capers Jones underscores the importance of measurements in software projects by using a medical handbook approach along the lines of *Control of Communicable Diseases in Man*. Jones identifies the most serious risks as **inadequate measurement** (measuring the wrong things) and **inaccurate metrics** (measuring things in the wrong ways).

We've seen more examples of this than we can count. Often, both end users and vendors don't focus on the most important factors about a product or application – and these inaccurate measures introduce the risk of problems down the road. For example, if little importance is placed on integration, but integration turns out to be a major part of the implementation effort, developers will fall behind schedule. Likewise, if an organization wants a system for 5,000 users but ignores architectural issues, there are risks that the system may not scale to meet their needs.

Conventional Acquisition Approaches Fall Short

The typical technology acquisition process is fairly straightforward. You define your business requirements (e.g., reducing the litigation and operational costs and risks of RM). You define your functional requirements (what you want the system to do). You define your technical requirements (the hardware, software, database and network specifications). You might even conduct a feasibility study or cost/benefit analysis.

Once you've been through this process, it's time to put a request for proposal (RFP) out for vendor response. You sort through the responses, and you're well on your way to writing a check to one of the vendors.

But what are the key factors that most RFPs and vendors stress? Usually, the major focus is on features, functions, and price, perhaps with some attention to IT specifications. But most RFPs ignore critical implementation issues that can make or break a project. Again, it's all about measurement: RFPs often measure the wrong things, or measure things in the wrong way. We routinely see this happen in five key areas.

?? ***Enterprise needs:*** RFPs often look at business, functional, and technical requirements that are too narrowly focused and granular – usually because specific departments have requested this type of information. Overall, RFPs do not adequately account for the needs of the enterprise as a whole. Thus, the solution does not share enterprise resources and does not meet the needs of a broader range of users in multiple departments.

?? ***Application needs:*** While it is important to understand the features and functions you'll need, we find that most products in a given information management technology segment (like DM, workflow, etc.) achieve functional parity every six to 12 months or so. Many RFPs overemphasize features – and if enough customers put a particular feature on their RFPs, it's only a matter of time before all the products offer it. Similarly, few organizations prioritize the features they want, nor do they analyze their application for future needs.

- ?? **Resource availability:** Few RFPs seek to measure the resources required to implement a solution (time, people, expertise, and capital). Likewise, many organizations fail to accurately measure their own resource availability for all the stages of implementation, including development, deployment, training, support, and administration. Often, one resource – price – is overemphasized, while neglecting factors that impact other resources (and costs) throughout the product’s life cycle
- ?? **Development needs:** It is critical to measure the level of flexibility you need, the level of complexity you’re prepared to handle – and to find a product that can deliver. For example, out-of-the-box solutions are simple, but may not offer the flexibility your application needs. Conversely, toolkits offer more flexibility, but can be highly complex. Either way, you’re left with a system that doesn’t meet your needs – if you can get it into production at all.
- ?? **Vendor qualifications:** Doing only a cursory evaluation of your vendor can create huge risks. If the vendor fails as a business, or fails to support the customer, or changes its “strategic direction,” it all adds up to big problems for customers. Such disasters can be averted by a careful assessment of the vendor’s strategy, customer base, support, and integrator network.

Ask the Right Questions

Clearly, the best way to mitigate the risk of a poor technology choice is to properly measure what you need, and properly measure what your potential solutions offer. To do this effectively, we recommend that you ask the right questions to help you define your requirements in five criteria areas: enterprise requirements, application requirements, resource requirements, development requirements, and vendor requirements.

Most RFPs focus on the first category, application requirements. But by asking the right questions in all five areas, you can ensure that you're measuring the right things. The following table identifies the questions to ask when taking your measurements in each requirement area. These measures should be taken during every stage of the acquisition process: when you're doing your initial requirements definition, when you're creating a high-level system design, and when you're evaluating products.

Requirement Category	Relevant Questions
Application requirements	?? What functional tasks do you need performed? ?? Can the product do the job?
IT requirements	?? What is your current and future IT environment like, with respect to platforms, databases, hardware, and software? ?? Is the product designed to both fit into your IT environment and grow and change as your application needs demand?
Development requirements	?? How much flexibility do you require and how much complexity can you permit? ?? Is the product flexible, yet simple enough?
Resource requirements	?? What resources are available for development, deployment, administration, and support? ?? Does the product fall within your resources?
Vendor requirements	?? What kind of vendor is appropriate for your organization and application? ?? Is the vendor appropriate?

Table 6 – Questions to Ask for Different Requirement Areas

It is worthwhile to note some points about resource requirements and development requirements. Although you might not think so, these two requirements areas can cause the most pain in a system implementation project.

Resource requirements pertain to everyone involved in the records management initiative – which increasingly is significantly more people than just the records managers. The records management initiative and process will likely involve records managers, the IT group, end users, and senior management, to name a few. With this in mind, some RMS vendors are taking steps to reduce the resource requirements of their products. Such steps include creating Wizards to simplify implementation or building simple interfaces to make using the system more intuitive.

With respect to development requirements, a simple rule of thumb is that projects should get beyond the prototype phase within three months. But most information management projects don't, and many never get beyond what we call "prototype paralysis."

Implementation projects can get stuck in prototype phase for two reasons: the product is either not flexible enough or it is too complex. If a system is simple but inflexible, the prototype might be built quickly but the project will never get beyond this phase because the system cannot address the application's requirements. If a system is too complex, the project may never even make it into the prototype stage in the first place. In either case, incentive to finish the project diminishes, and many organizations may eventually cut their losses and abandon the project.

IV. ASSESSMENT APPROACH

This section provides information on the evaluation methodology, the evaluation scenario, the evaluation process, and the general criteria categories used for comparing products in the RMS benchmark study.

General Evaluation Methodology

To select the appropriate RMS solution, an organization must first define its application requirements, then evaluate different products to find the one that best meets its needs.

This is the basis for Doculabs' evaluation methodology. The cornerstone of Doculabs' research is to have vendors bring their products into our lab, where our analyst team uses the products to build real-world application scenarios. This process gives us hands-on experience with the products' features and functions, and gives us a flavor for overall usability and the administrative effort required to deploy and manage the systems.

But features and functions only tell part of the story. For end user organizations, there's a whole lot more that goes into a product decision. Therefore, we use our hands-on product assessments as a forum to explore many other factors that are important to customers. These customer requirements can be grouped into five major categories:

- ?? Application requirements
- ?? IT requirements
- ?? Resource requirements
- ?? Development requirements
- ?? Vendor requirements

Thus, Doculabs' hands-on laboratory evaluation process allows us to work with the vendors in exploring a much broader range of issues than just features and functions. This ensures that our analysis takes the total product picture into account.

The following table describes each of the organizational requirements.

Requirement Area	Description
Application requirements	This category focuses on the features and functions that an organization requires. For example, companies that need an RMS will need features such as the ability to classify records and establish retention schedules. Application requirements will be different for a DM system, and will include features such as version control, check-in and check-out, and document history.
IT requirements	This category focuses on the architectural requirements that are of interest to the IT staff. Does the system run on UNIX or Windows NT? What kinds of databases are supported? Can the architecture scale to meet the needs of thousands of connected users?
Resource requirements	This category focuses on the resources needed to deploy the system. Usually this can be expressed in terms of time, people, and money. How much time will be required to get the system into production? Will you need people with special expertise or training to build the applications and deploy the system? What are the software costs? The professional services costs?
Development requirements	This category focuses on flexibility and complexity. Ideally, customers want systems that are flexible enough to handle their needs, but not so complex as to make application development a cumbersome process. In other words, the goal should be to have flexibility in what the system can do, with a minimum of complexity in what you must do to meet your application needs.
Vendor requirements	The vendor of the product itself should be a major factor in the product you choose. Is the company stable? Does it provide the level of support your organization needs? What are the vendor's product enhancement plans? Its future direction?

Figure 2 – Doculabs' Evaluation Methodology: Organizational Requirements

Evaluation Scenario and Process

The test application was a real-world scenario of the customer correspondence group of a major midwestern bank. The group's scenario was a need to capture incoming documents, classify them as records, archive them, and make them available for user retrievals, distribution, or other output.

In general, Doculabs' analyst team spent two days working with each vendor learning about the product, installing and configuring the system, and building the sample application. We then gained experience in using the system to define users and groups, create file plans, classify records, retrieve records, and set up and apply retention and disposition schedules.

The intent of the exercise was to focus on the **process** of deployment, development, and ongoing use. Thus, the evaluation process gave us a thorough understanding of the full complement of features and functions that each product offered, and enabled us to see how the product performed in a simulated production environment. Additionally, the exercise gave us a feel for factors such as overall usability, ease of administration, and the comprehensiveness of each offering.

Doculabs' analyst team consisted of individuals with varying experience levels, which is a typical scenario in most organizations. The analysis presented in this report represents the collective opinions of the analyst team.

RMS-Specific Categories for Comparison

Armed with the analysis from our assessment process, we took a closer look at how the RMS products stacked up against each other. Our goal was to identify the major areas that differentiate RMS products. We identified three categories of differentiation that we consider to be the most helpful for helping organizations choose the right RMS solution:

- ?? Records management capabilities
- ?? End user capabilities
- ?? IT capabilities

Clearly, there are other factors that will come into play when making a procurement decision, as discussed in our general evaluation methodology – factors such as vendor stability, future direction, customer support, and price. But focusing on the three comparison categories will provide a solid foundation for helping you narrow your choices.

The following table summarizes the issues we considered in each category.

Category	Description	Sample Criteria
Records management capabilities	Features or capabilities that are important to records managers	?? Infrastructure issues, such as the file plan and access control ?? Paper handling, such as file handling, box handling, charge-in, and charge-out ?? Managing retention and disposition ?? Supporting reports
End user capabilities	Features or capabilities that are important to end users	?? Level of functionality provided ?? General usability ?? Client-side integration with desktop applications or EDMS products ?? Browser-based access to the RMS
IT capabilities	Capabilities, or architectural issues that are important to IT personnel and administrators	?? Platform and database support ?? Architecture and scalability ?? Level of integration with operating system ?? Flexibility and complexity of development and integration

Table 7 – Sample Criteria for the Comparison Categories

For a more detailed description of the key characteristics within each category, refer to Section V, “Comparing Records Management Systems.”

V. COMPARING RECORDS MANAGEMENT SYSTEMS

This section compares the RMS solutions we evaluated. This section provides an analysis of how the products stacked up in three major comparison categories, and presents best uses for each product.

Comparison Summary

We compared the products in three categories that we feel are most helpful for choosing the right RMS solution: records management capabilities, end user capabilities, and IT capabilities. We chose these comparison criteria because they address the needs of the major user groups that may be involved with records management.

- ?? For **records manager capabilities**, we were looking for the features needed to perform typical records management functions, both for electronic records and paper records. Some products excel in electronic records management, while offering only basic capabilities for paper records. Other products excel at paper records, while offering only basic functions for electronic records. In general, we were looking for capabilities and a single point of management for *all* records.
- ?? For **IT capabilities**, we were looking for the RMS products' ability to integrate into customers' existing infrastructures, leverage existing technologies, and simplify deployment and maintenance. In essence, we were looking for RMS products to be first-class IT citizens.
- ?? For **end user capabilities**, we were looking for the RMS products' ability to make records management functions easy for end users to learn, particularly for users that aren't familiar with records management. This is a two-sided requirement. On the one hand, RMS software should make declaring and classifying records as painless and unobtrusive as possible. On the other hand, RMS software should reward such responsible behavior with simple but rich capabilities for searching the records repository (both electronic and paper). In addition, RMS products should allow users to access the system from their choice of client – including a Web browser.

Rating the Products

Within each criteria category, we identified the major criteria that can be used for product differentiation and evaluation. In each of these areas, we scored the products on a scale of 1 to 5, with 5 being the highest. These scores represent our analyst team's collective opinion about the capabilities and comprehensiveness that the products offered in each criteria area.

Our evaluations will be helpful in understanding the type of application that each product is targeting and in determining whether the product makes a good fit for your own application's functional needs.

We began this assessment with the clear understanding that not all products would be able to provide comprehensive solutions in all areas. **The purpose of the evaluation was to explore the capabilities and target applications for each product, and to describe each product's best fit or ideal deployment.**

We have not weighted any category as more important than any other. Keep in mind that depending on your application, some requirements will be more important than others. Your challenge as a reader using this analysis for your own product selection is to weigh each of the requirement areas against your own particular needs.

This section points out some strengths of each system in each category, but the discussion is by no means all-inclusive. For more detailed analysis, refer to Section VI, "Records Management Product Reviews."

Records Manager Capabilities

In this category, we were looking for capabilities that are important to records managers. We concluded that there are two major classes of records management capabilities: **records center capabilities** and **electronic records management capabilities**.

The following table shows the current leader or “benchmark” that we identified for each criterion within the category of records management capabilities.

Records Manager Capabilities	Benchmarks	Reason
Records center capabilities	Cuadra STAR/RIMS	RM flexibility provided by powerful back-end; rich space management functionality
Electronic records management capabilities	Provenance ForeMost	Overall, provides the most out-of-the-box capabilities for managing electronic records

Table 8 – Benchmarks for Records Management Capabilities

In terms of traditional **records center capabilities**, the RMS must allow the creation of a corporate records plan, and it must allow the records manager to apply formal records retention and destruction operations on the documents – specifying which documents to destroy, which documents to transfer, and when to do it. Other key RMS features include functions like file and box handling, charge-in and charge-out, and advanced records center functions such as space or shelf management and reporting.

Cuadra STAR was the benchmark for records center capabilities among the products we evaluated. The product provides the most flexible system for records managers, with a powerful back-end for information classification and storage. In addition, Cuadra STAR provides powerful capabilities for global changes and updates, along with advanced allocation management functionality and solid costing and charge-back capabilities.

The other products also offer mature records center capabilities, with good flexibility for record plans, declaring and classifying, applying disposition schedules, and searching. IN InSight and PSSoftware RIMS offer good space management, which Provenance ForeMost lacks. TOWER TRIM and PSSoftware RIMS lack costing and reporting features. EDUCOM provides adequate physical record management capabilities, but lacks any space management capabilities.

In terms of **electronic records management capabilities**, a good RMS should effectively bring both electronic and non-electronic records under its control (a capability some DM systems are also incorporating). This ensures that record profiling and access is consistent and systematic across document types, no matter what the format or where they're stored. A good RMS should provide the ability to manage the repository of electronic records, or to integrate with an EDMS that provides this capability.

The benchmark for electronic records management was Provenance ForeMost. Out of the box, the product can perform all records management capabilities on electronic records. The product can manage its own repository for electronic records, and it also provides gateways to a number of EDMS systems – this gives organizations the flexibility to manage records within the RMS or an EDMS.

Cuadra STAR, IN InSight, and TOWER TRIM can manage electronic records on their own, with no EDMS needed. TOWER provides an optional integration with PC DOCS, while Cuadra and IN currently provide no EDMS integration (although we expect this to change soon). PSSoftware currently does not manage electronic records on its own, requiring an EDMS (a future version will integrate with Windows NT to manage electronic records). EDUCOM works only with PC DOCS, but leverages most of DOCS' capabilities for handling documents.

Provenance ForeMost and TOWER TRIM are compliant with the Department of Defense's 5015.2 specification, which lists the DoD's required capabilities for managing electronic records. Most of the other vendors are preparing for certification. For example, PSSoftware is going to try to certify its Windows NT 4.0 solution, and EDUCOM is going to submit a PC DOCS integration with improved e-mail records management capabilities.

Product Positioning

The following figure shows how we position the products with respect to their records center capabilities and their electronic records management capabilities. In each criteria category, we scored the products on a scale of 1 to 5, with 5 being the highest. Products in the upper right-hand quadrant provide the best mix of strong records center capabilities and strong electronic records capabilities.

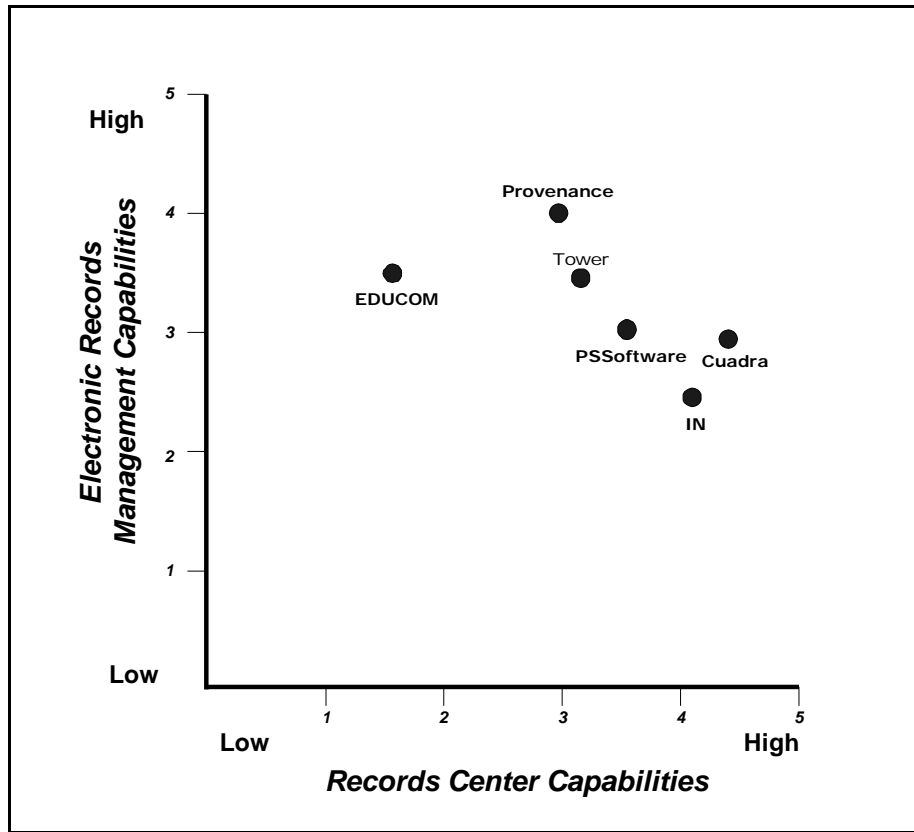


Figure 3 – Records Manager Capabilities Comparison

IT Capabilities

As records management gains acceptance as a strategic initiative, organizations will manage the RMS just as they would any other information management technology. Thus, IT groups will be evaluating RMS products with an eye toward cost of administration, ease of deployment, integration, and the ability to leverage existing infrastructure components, operating systems, and databases.

This area is a challenge for many RMS products. Most systems were originally created to handle paper-based records, and were not intended to be a part of a company's information management infrastructure. As this changes, vendors are investing in their product architectures and technological capabilities to provide a more viable foundation for enterprise usage.

We concluded that there are four key areas within IT capabilities: **internal flexibility** (ability to configure the RMS as needed); **external flexibility** (ability to integrate the RMS with other systems as needed); **ease of deployment and administration**, and **enterprise “pervasive” scalability** (the ability for the RMS to exist on every desktop in a globally distributed enterprise – based on our architectural review of each product).

The following table shows the current leader or “benchmark” that we identified for each criterion within the category of IT capabilities.

IT Capabilities	Benchmarks	Reason
Internal flexibility	Cuadra STAR/RIMS	Provides the most configurable system
External flexibility	Provenance ForeMost	Has most proven integrations with EDMS products, both client/server and Web; has toolkit approach
Ease of deployment and administration	IN Insight and TOWER TRIM	Both products can be deployed, run, and administered with little or no IT support
Enterprise “pervasiveness”	Provenance ForeMost	Most EDMS offerings, best developed Web client

Table 9 – Benchmarks for IT Capabilities

In terms of **internal flexibility**, Cuadra STAR provided the most configurable system. All interfaces and parameters are completely customizable, and records managers can set the system up any way they want.

In terms of **external flexibility**, Provenance ForeMost provided the most flexible solution. The product takes a decidedly toolkit approach, and it has the most proven integrations with EDMS products, including PC DOCS, FileNET, Open Text, and Lotus Notes.

In terms of **ease of deployment and administration**, IN InSight and TOWER TRIM were the benchmarks. With both products, IT involvement can be kept to a minimum. IN InSight uses a Microsoft Access database, which allows you to deliver records management without IT support. TOWER TRIM comes with its own ISAM database that's ready to go as soon as you install the system from CD. Both products allow easy migration to relational database as volumes and the number of users increase. Both PSSoftware and EDUCOM require the installation of a third party document management product (and relational database).

Provenance was also the current leader for **enterprise pervasiveness**. Enterprise deployments require robust Web and messaging capabilities, which Provenance has (via Odyssey, LiveLink, and Notes). In addition, ForeMost uses a standardized back-end (convenient for IT), and it provides a broad spectrum of access options, including many proven integrations with EDMS products and groupware. We think such characteristics give Provenance the best chance to achieve "RM on every desktop".

Another product to watch in this area is PSSoftware. We saw a preview of RIMS 7.0, which is vastly improved in the IT area. It provides deep Windows NT integration and a single interface for users, records managers, and administration – which will provide a competitive challenge if it delivers on its design goals.

Product Positioning

The following figure shows how we position the products with respect to their IT capabilities in the areas of internal flexibility and external flexibility. In each criteria category, we scored the products on a scale of 1 to 5, with 5 being the highest. Products in the upper right-hand quadrant provide the best mix of internal and external flexibility.

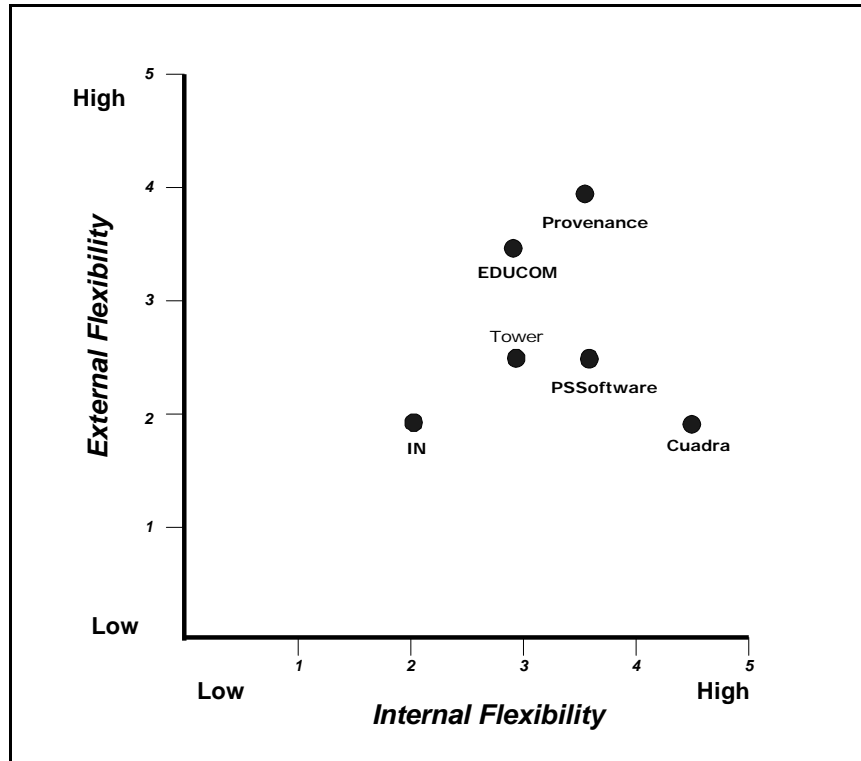


Figure 4 – IT Capabilities Comparison (Internal vs. External Flexibility)

The following figure shows how we position the products with respect to their IT capabilities in the areas of pervasive scalability and ease of deployment. In each criteria category, we scored the products on a scale of 1 to 5, with 5 being the highest. Products in the upper right-hand quadrant provide the best mix of robustness and ease of deployment.

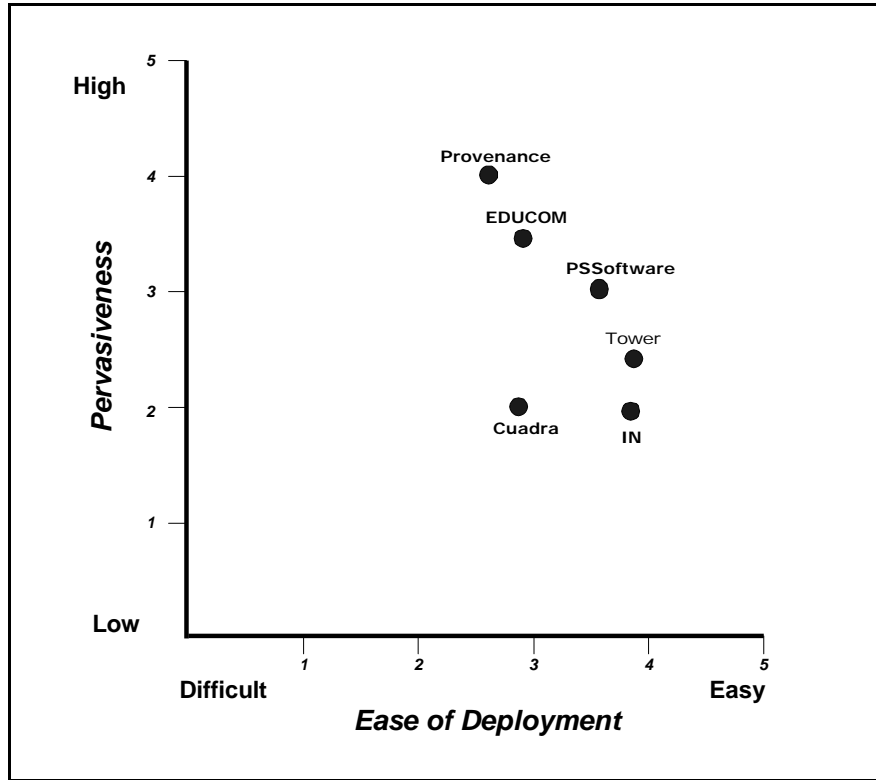


Figure 5 – IT Capabilities Comparison (Pervasiveness vs. Ease of Deployment)

End User Capabilities

Putting the RMS into the hands of business users can extend RMS benefits to people who formerly had no experience with records management. Many organizations want to allow users to classify records, search for records, and submit retrieval requests – right from their desktops. Thus, users can add to the records repository, and they can make informed business decisions based on information in the records repository.

The trend is for records management to be opened up to the entire organization. Thus, we concluded that there are two major categories for end user capabilities: **ease of filing and classification** and a **Web interface** that allows users to easily access the RMS from any desktop.

The following table shows the current leader or “benchmark” that we identified for each criterion within the category of end user capabilities.

End User Capabilities	Benchmarks	Reason
Ease of filing and classification	Provenance ForeMost and Cuadra STAR	Provides the most flexible end user capabilities in terms of the different ways in which users can file and classify records
Web client	Provenance ForeMost	Web client is extremely flexible, can do everything the regular end user client can do, and it integrates with Open Text LiveLink for Web-based EDMS

Table 10 – Benchmarks for End User Capabilities

In terms of **ease of filing and classification**, this is an area where most of the RMS systems we’ve seen could use some improvement. Because most systems were originally designed for records managers who know the discipline, things such as interface design and intuitive features were less important. But today’s end users have expectations that the products they use will all have a consistent look and feel, and will be relatively simple to understand.

Provenance ForeMost and Cuadra STAR were the benchmarks in this category. These systems are flexible, allowing users to declare and classify records from any number of points, including standard clients, Web browsers, or certain desktop applications. Cuadra STAR also offers access from mainframe terminals, while Provenance ForeMost offers access from EDMS applications such as Open Text and groupware such as Lotus Notes.

In terms of the **Web interface**, this is an area where we expect to see the most rapid advancement in the RMS space. As the Web evolves into a more commonly-used application platform, it is imperative that products provide viable Web-based front-ends that give users the full complement of system features and capabilities.

All of the products we evaluated offer at least a basic Web interface, which is good news. The best among the products we evaluated was PSSoftware RIMS Navigator. From a browser, users can view records in many ways, see which users have charged out certain records, search across multiple databases, and save and share queries. Users can also submit requests via e-mail and pass records to other users.

Product Positioning

The following figure shows how we position the products with respect to their end user capabilities in the areas of ease of use and Web interface capabilities. In each criteria category, we scored the products on a scale of 1 to 5, with 5 being the highest. Products in the upper right-hand quadrant provide the best mix of capabilities for user classification and Internet accessibility.

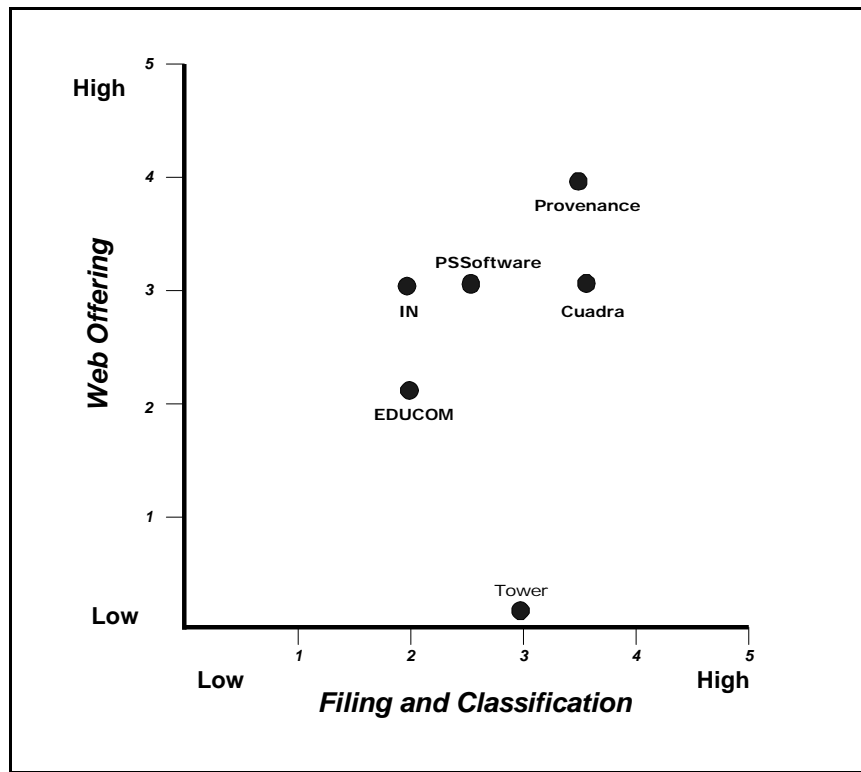


Figure 6 – End User Capabilities Comparison

Best Uses

The following table identifies the best uses or ideal application fit for each of the products in our study.

If ...	Then Use ...	Because ...
You want flexible records management functionality, or you need archival and integrated library services	Cuadra STAR	?? It has remarkable depth of functionality and flexibility for archivists and corporate librarians, with powerful searching ?? It has a basic Web client
Your primary need is for managing electronic records, and you already use PC DOCS	EDUCOM RecordMANAGER	?? It is a DOCS Open add-on with tight integration ?? It allows DOCS Open to be the primary system for both DM and records management
You want general paper and electronic records management functionality	IN InSight	?? It offers good general functionality, with the ability to access multiple distributed repositories ?? It has good paper management capabilities ?? It has a basic Web client
You have both electronic and paper records, you want to integrate with a DM system, and you need to deploy to many desktops	Provenance ForeMost	?? It integrates with multiple EDMS products (including PC DOCS, FileNET, Open Text, and Lotus) ?? It can be deployed over the Web (via Odyssey or Open Text) ?? It has stand-alone capabilities ?? It is DoD 5015.2-certified
You have PC DOCS or FileNET, and you have basic space management needs	PSSoftware RIMS	?? It provides a packaged integration with PC DOCS and FileNET for electronic records management ?? It has basic space management capabilities ?? It has a basic Web client
You have one or several departments requiring both electronic and paper records management, you need basic EDMS functionality, and you have little IT support	TOWER TRIM	?? It has general electronic and paper records management functionality ?? It includes basic DM and routing functionality ?? It integrates with PC DOCS ?? It requires very little IT support ?? It is DoD 5015.2-certified

Table 11 – Best Uses

VI. RECORDS MANAGEMENT PRODUCT REVIEWS

This section provides reviews of the RMS solutions from the following vendors:

?? Cuadra Associates

310-478-0066

www.cuadra.com

STAR 3.5

?? EDUCOM

215-340-2921

www.olap.com

RecordMANAGER 2.5

?? Information Network, IN Inc. (IN)

713-862-7954

www.intorm.com

InSight 32

?? Provenance Systems

703-875-8701

www.provsys.com

ForeMost 7.0

?? PSSoftware

613-226-5660

www.pssoft.com

RIMS Studio 6.0

?? TOWER Software

703-359-4343

www.TOWERsoft.com.au

TRIM 4.1

Cuadra Associates, Inc. (STAR 3.5)

This section provides background information on Cuadra Associates, Inc., and presents Doculabs' analysis of the STAR text management/retrieval system and the STAR/RIMS application for records management.

Company and Product Background

Cuadra Associates, Inc., founded in 1978, is a privately-held company headquartered in Los Angeles, California. Cuadra Associates' first installation of the STAR text management and retrieval solution was in 1982, and the company now has an installed base of over 350 sites. The company sells its software directly in North America and through resellers in other countries. The company provides data conversion services and hardware as part of some STAR sales.

The core STAR product is a text management and information retrieval system that allows organizations to manage structured and full-text information. In addition, Cuadra Associates offers a number of packaged applications for specific markets, such as records management, libraries, museums, archives, and competitive intelligence. All of these application packages are developed using capabilities of the core STAR software.

The following table summarizes STAR's client and server support.

Client Platform	Server Platform
?? Windows 3.x	?? DEC Alpha ?? SCO UNIX
?? Windows 95	?? HP-UX ?? Sun OS
?? Windows NT	?? IBM AIX ?? Sun Solaris
?? Any Web browser	?? Motorola ?? Windows NT
?? Dumb terminals	SVR4
?? VT220/320 terminal emulators	

Table 12 – Client and Server Support: STAR

Doculabs evaluated STAR 3.5 and the STAR/RIMS packaged solution. The server was installed on a Sun SPARC 5 server running Solaris. The clients (STAR Client and STAR Web) were running on Windows 95.

Product Overview

STAR is a text and information management and retrieval system. The system allows organizations to index all of their documents and other information (including fields and full text), manage them using the STAR database, and quickly retrieve information using STAR's powerful search and report capabilities. Thus, the core product's strength is in text management – particularly in bringing structure to databases of unruly text.

The system was originally developed as a multi-user system for UNIX and other operating systems. Today, the system uses a UNIX or Windows NT back-end (though at the time of the assessment, only the UNIX version was available). Clients can be Web browsers, Windows clients, or terminals that emulate VT220/320. STAR has a powerful general core technology, and Cuadra has developed packaged STAR solutions for a number of markets.

Because of its indexing, retrieval and report-generation capabilities, STAR is a viable solution for records management applications. Cuadra's STAR/RIMS is a packaged application for records and information management. The STAR/RIMS solution can handle both electronic and paper records.

Another big advantage of STAR is its customizability. Developers can modify the appearance of any STAR screen, and can enable or disable specific functions for specific user groups. Even the packaged STAR applications do not restrict organizations from making modifications as needed to meet their unique business requirements.

Architecture and Components

STAR is a 32- or 64- bit system (depending on the hardware and platform) that runs in a UNIX or Windows NT environment. Architecturally, the system uses a host model. The application and the database sit on the host, and users can connect via different interfaces.

The product offers three interface choices: the Classic STAR character-based terminal interface, a Windows-based client, and a Web browser interface. Classic STAR runs on terminals and on PCs, under terminal emulation, while the Web interface and the Windows client access the system via the STAR API. Cuadra's future strategy is to have a single client interface.

For records managers, Classic STAR provides five major functions: defining databases, data entry, searching and reporting, making global changes, and managing the system. End users will use primarily data entry or search and report, using one or both of the graphical interfaces.

Cuadra offers an application package called WorkSaver that provides a direct integration with Microsoft Word or WordPerfect. From the word processor users can profile a document and add it to the STAR repository.

STAR does not depend on any third-party products. It uses its own flat-file DBMS to store all profile information, text index information, system information, and pointers back to the original documents (if electronic). The DBMS offers excellent performance, and users and administrators are usually insulated from the intricacies of the DBMS.

The DBMS is optimized for STAR's purposes; it can represent hierarchies of records and show relationships, and it has no fixed lengths and no fixed number of occurrences; it can easily handle variable-length fields and records. Still, it is proprietary, so SQL database administrators must learn a new system.

For integration, Cuadra does not currently offer a documented API, and the system is not designed to integrate with EDMS support technologies such as document capture or storage management systems. (Cuadra plans to offer multiple API options for SQL interfaces by late 1998 and to provide interfaces to one or more EDMS products.)

Capabilities

This section describes the functionality that STAR provides, in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

The Classic STAR interface is used to perform most system administration functions. The character-based interface is not overly intuitive for the uninitiated, but it provides considerable power for system management.

Administrators are responsible for determining whether to use the predefined application packages (such as STAR/RIMS) or modify them. Where new databases need to be created, administrators are responsible for defining the database, defining the fields within the database, specifying how those fields will be indexed for retrieval, and defining the reports that will be needed. Administrators can also enter records or edit them, make global changes, and perform general system administration.

Administrators also create users and groups and assign the appropriate permissions. STAR provides very granular security, including operating system-level security, STAR system-level security, database security, function security, and command-level security.

Organizations will want to be very methodical and systematic in their system configuration, since it will drive the power of the system. While system setup is not difficult, it will be a time-consuming effort, and the character-based administration interface is not particularly attractive for those used to graphical utilities. The effort is lessened somewhat with the STAR/RIMS package, which is a predefined plug-and-play application.

The administration utility includes other helpful options. For example, administrators can specify “views” of a database, which can be a rule or reordering based on a field type that changes the way the data is presented. STAR also provides excellent audit trail capabilities.

The STAR system is highly flexible and allows developers to customize the system to meet the needs of the application. However, as indicated earlier, STAR does not yet have a published API for integrating with other applications.

Records Manager Functionality

For records management applications, Cuadra Associates offers STAR/RIMS, a packaged STAR application. This ready-to-use application comes with database definitions and custom tools, like task menus, search pages, input forms, and predefined reports that are tailored for records management professionals and end users.

Overall, STAR/RIMS maps the business process, and provides standard records management capabilities. Records managers can modify the database to match the file plan, add records to the system, and use field options to manage retention and disposition. STAR/RIMS also provides advanced allocation management functionality, as well as solid costing and charge-back capabilities.

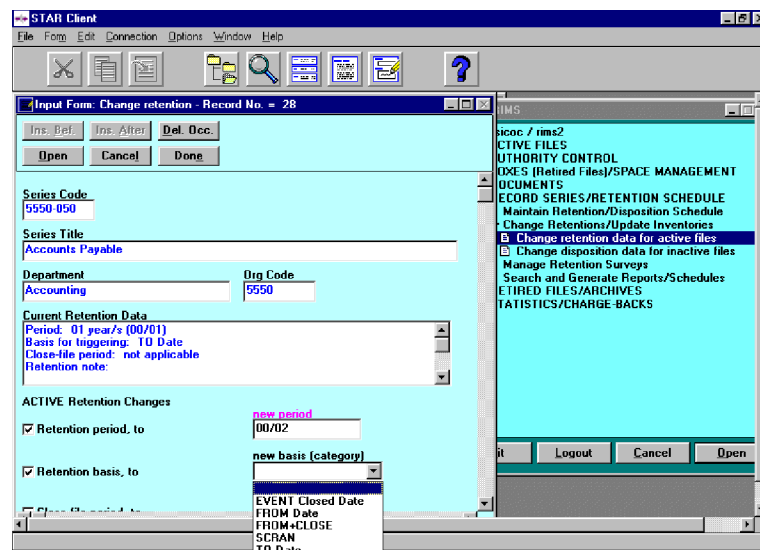


Figure 7 – Changing Retention Data in STAR

One of the most helpful features is global data manipulation. Records managers can reformat a data type or definition and apply the new definition to all items of that type. Data can also be migrated from one database to another, or separate databases can be merged.

Reporting is another of STAR's strengths. STAR provides a number of pre-defined reports, and records managers can build custom reports. Thus, there is flexibility to customize the reports in order to view data in the database in different ways. For example, reports can be set up to sort and filter data by text or numeric fields and to nest data into multiple levels.

There is inherent complexity in STAR and the STAR/RIMS package. The system can deal with records at all levels (document, file, and box), not all of which will be relevant to every organization. It will take time to learn how to leverage the system's capabilities, unless Records Managers choose to use the STAR/RIMS package with no customization.

End User Functionality

Users typically access STAR from the STAR Windows client. The interface is flexible and provides considerable functionality. The STAR/RIMS packaged solution provides a customized, task-oriented STAR client that puts the user functions into a records management context. The client can be modified to tailor the interface for the specific needs of end users who are interacting with the RMS.

From either the Windows or character-based interface, users with appropriate rights can create new entries (records), edit existing records, copy and delete records, and search the records repository. The records manager can configure the default searching methods available to users.

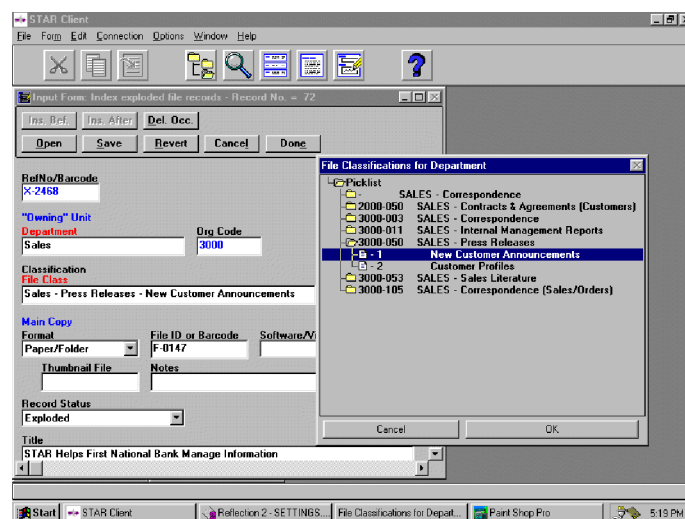


Figure 8 – Classifying Records in STAR

Searching is a key strength of STAR. Users can perform fielded or full-text searches. STAR enables simple and complex searching, and it supports Boolean, proximity, range, multi-field range, wildcard, fuzzy logic, and concept searches – all of which are available to users through Cuadra's

assisted search interface. However, users cannot search across multiple repositories or databases simultaneously (planned for late 1998).


In terms of integration with desktop applications, STAR offers WorkSaver, an optional application package that allows users to add electronic files to the records repository straight from Word or WordPerfect. This is a good first step and will encourage use of STAR because users they can access it from the tools they're accustomed to using. Users can also generate reports on the database, just as records managers can.

Retrieved 2 records. Displaying items 1-2.

Retrieved Items by T

Select	Title
<input type="checkbox"/>	Cover Letter with QWERTY Company Contract Source document in Word
<input type="checkbox"/>	Cover Letter with QWERTY Company Contract (re Source document in Word Click here to see image Source document image

Retrieved 2 records. Displaying items 1-2.

Accepted for company by: 

STAR Web is a CGI-bin, state-aware program. Like most of the other RMS products' Web clients, the interface is HTML-based. STAR Web is a good first step, but it's not yet as functional as the STAR client. In addition, the STAR Web client does not provide filing and classification capabilities, and the look and feel is inconsistent with the Windows client.

Strengths and Challenges

The following table summarizes STAR/RIMS' strengths and challenges.

Strengths	Challenges
?? Powerful back-end for information classification and storage, particularly for electronic records	?? System setup can be time-consuming
?? Designed for text management applications	?? Windows client interface could use improvement
?? Strong search capabilities	?? System currently requires UNIX
?? Flexible reporting capabilities	
?? Provides a basic Web interface with rich searching capabilities	

Table 13 – Strengths and Challenges: STAR/RIMS

Ideal Deployment

STAR/RIMS is best suited for the following scenarios:

- ?? You have a records management application with a focus on archival
- ?? You need powerful searching capabilities
- ?? You need to manage large amounts of text in addition to records
- ?? You are a UNIX shop

EDUCOM Business Solutions (RecordMANAGER 2.5)

This section provides background information on EDUCOM Business Solutions and presents Doculabs' analysis of RecordMANAGER.

Company and Product Background

Founded in 1989, EDUCOM has grown from a Sydney-based IT training company into a multi-million dollar international solutions organization. The company has offices in Australia, Canada, the U.S., the UK, Denmark, Hong Kong, and Singapore. The Business Solutions division provides solutions for knowledge management, on-line analytical processing (OLAP), reporting, and records management.

RecordMANAGER is an add-on for PC DOCS' DOCS Open that offers functions for managing electronic and physical records in conjunction with DOCS Open. In the near future, EDUCOM will focus on e-mail management; the company is postponing DoD 5015.2 compliance testing until it releases its PowerDOCS client for the DOCS Fusion server.

Key vertical applications for EDUCOM include government, publications, and legal. EDUCOM's customers include government agencies in Australia, Western Power Corp. in Australia, and the County of San Diego. Key vertical applications include government, publications, legal, and highly regulated industries such as power generation.

The following table shows RecordMANAGER's client, server, and database support.

Client Platform	Server Platform	Database
?? Windows 3.11	?? Same server as	?? Same databases as PC DOCS
?? Windows 95	DOCS Open	?? Oracle
?? Windows NT	?? Windows NT or	?? Microsoft SQL Server
	Novell NetWare	?? Sybase

Table 14 – Client, Server, and Database Support: RecordMANAGER

Doculabs evaluated a commercial release of RecordMANAGER 2.5.1 running with DOCS Open 3.7.1. We ran the server on Microsoft Windows

NT 4.0 with a SQL Server 6.5 database. Clients ran on Windows 95. We also saw a pre-release version of RecordMANAGER 3.0 (released 5/98).

Product Overview

With RecordMANAGER, one of EDUCOM's strategies is to provide general RM functionality for electronic documents (managed by DOCS Open). The system leverages the key strengths of DOCS Open, which includes application integration, version control, security, and storage management. RecordMANAGER adds general RM functionality such as filing and classification, retention and disposition, and security.

Another of EDUCOM's goals is to provide general RM functionality and physical document management functionality for hard-copy documents. Physical document functionality includes barcode support and movement tracking and auditing.

Among the RM products that integrate with DOCS Open (ForeMost, RIMS, and TRIM), RecordMANAGER is the best fit for those who want to add RM functionality to their existing DOCS document management system (as opposed to organizations who are focused on records management and use DOCS Open just to manage electronic records). RecordMANAGER is really an extension of the DOCS Open environment, both in design and functionality. The system is unobtrusive, and is unified with DOCS at both the front and back ends.

RecordMANAGER requires a DOCS Open implementation, so it clearly is not for everyone. Because of this, RecordMANAGER is limited in how it can be rolled out in a staged implementation. For example, the system cannot first be used as a stand-alone system for paper records, later expanded to include both paper and electronic records, and then later integrated with a DM system. To immediately handle both physical and electronic records, the system must be integrated with PC DOCS from the start.

Architecture and Components

RecordMANAGER is a 32-bit client/server system. The product works on DOCS Open version 3.7 and higher for 32-bit operation, and DOCS Open 3.5 and higher for 16-bit operation. For add-on compatibility, it works with DOCS Imaging, Unplugged, and Reports. In late 1998, EDUCOM will introduce a PowerDOCS client that will work with the DOCSFusion Server.

Like DOCS Open, RecordMANAGER supports a wide variety of platforms and databases, including Microsoft SQL Server, Oracle, Sybase, and SQL Anywhere. Databases can be run on Windows NT, Novell NetWare, and several flavors of UNIX. The RecordMANAGER client supports all Windows platforms.

EDUCOM inherits DOCS Open's architectural capabilities, both good and bad. On the plus side, DOCS Open controls network overhead without sacrificing connection speed. Even though users can connect to multiple repositories, they maintain a persistent connection only with their primary database server. Users connect to secondary databases only to execute queries, and this connection terminates as soon as the query is complete.

On the down side, DOCS Open uses a two-tier configuration. This could be a limitation if you have numerous distributed databases. The client is responsible for making the database connections; we would have preferred that a server manage the connections. This is resolved with the Fusion server and PowerDOCS client.

The current version of DOCS Open uses a fat client, and much of the processing taking place at the client workstations. Although this approach has its advantages (providing a fully functional mobile/unplugged client), it assumes that every client is equipped with fast workstations – we would have preferred to offload processing to a server. With the newest release of the new version of PowerDOCS and its companion DOCSFusion Server, PC DOCS is moving its system architecture to a three-tier model.

For records managers and users, the RecordMANAGER client application provides the ability to file and classify records, request and retrieve them, and search the records repository. The client also performs administration functions such as system configuration and records management setup.

Capabilities

This section describes the functionality that RecordMANAGER provides, in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

Administratively, RecordMANAGER, like DOCS Open, is simple to use and deploy. Administrative tasks are performed with an intuitive graphical user interface and menu options. Installation was simple.

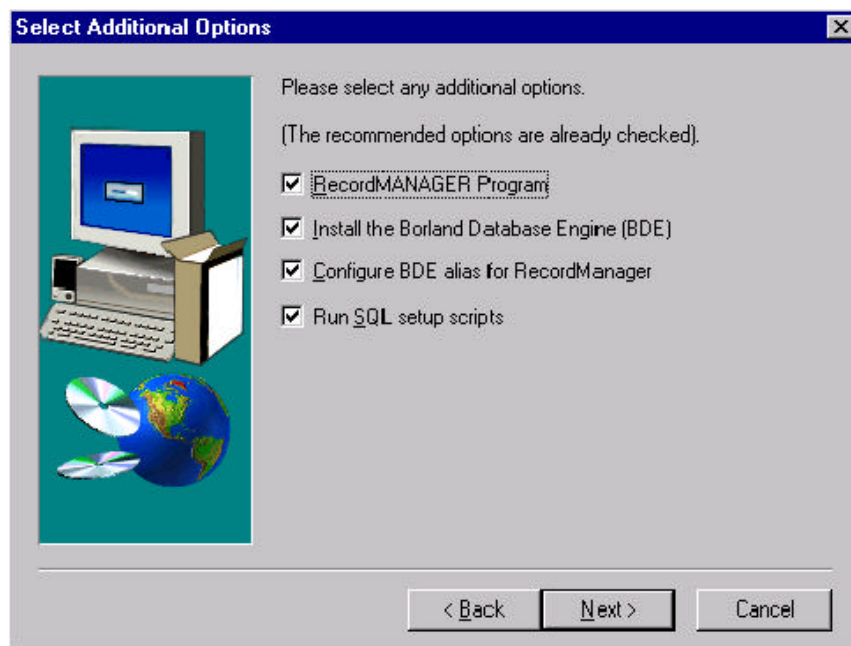


Figure 10 – RecordMANAGER Setup Dialog

Like DOCS Open, RecordMANAGER integrates with multiple network operating systems. It can replicate the user definitions, passwords, and securities in the Windows NT Registry as well as the Novell NetWare NDS. This eliminates the need for administrators to recreate the users in the RecordMANAGER/DOCS Open system. RecordMANAGER/DOCS Open users and groups can be synchronized with the network operating system at any time. Furthermore, a single DOCS Open user login can map to a user's ID on two different operating systems.

While such operating system integration is helpful, we were looking for a more complete integration. Integrations such as exposing parameters to the Windows NT Performance Monitor or integrating with the Windows NT Event Log would be useful for troubleshooting and for performance tuning to balance loads.

As RecordMANAGER forms and lookups are maintained in DOCS Designer, RecordMANAGER leverages the training and consistency of PC DOCS for all customization. You can modify forms for document profile, search, and hit list using DOCS Designer. The DOCS Designer also allows administrators to design custom retrieval forms without programming. Using the simple interface, administrators can drag columns from the available index field list and drop them onto the profile form. Thus, administrators can easily create separate profiles and interfaces for different work groups based on retrieval needs.

Security is very simple. Functional security leverages DOCS Open groups; it is more flexible than DOCS security, but still somewhat limited. For file access, RecordMANAGER uses DOCS Open document security. It has security inheritance between files and documents. File and document security is implemented using an Access Control List (ACL) that is built from a combination of Groups and Users (trustees) with various levels of access rights. RecordMANAGER enhances the traditional DOCS Open model by allowing security to be applied to files, file parts, and boxes.

In addition, RecordMANAGER provides three levels of security, for users, records administrators, and system administrators. Users have standard DOCS user rights, plus additional functions, such as profiling documents to existing file parts and freezing electronic documents. Records administrators have access to all RM functions, including thesaurus management, creating new file parts, retention and disposition management, auditing and census, and bulk movement/return as well as movement reporting.

Systems administrators have the most comprehensive rights. In addition to all of the previous permissions, they have DOCS Open system administration rights, RecordMANAGER functional security and movement security administration, and re-open closed file parts.

Records Manager Functionality

EDUCOM designed RecordMANAGER on the assumption that an organization will define a common classification scheme, to which individual business units may have specific additions. RecordMANAGER supports classification schemes with an unlimited number of terms, and up to three levels deep. It supports standard features such as cross-level searching and searching on non-preferred terms.

The scheme is typically a multi-level hierarchy of standard terms with which a document can be classified. A document's classification is its file, and is fully described by its list of terms. In RecordMANAGER, all documents in a file can be linked to a file security type and retention and disposition schedule. The file security type restricts access to all similar files such as personnel files.

RecordMANAGER allows for a flexible set of numbering schemes for files. A "file part" is a file instance that groups documents together within a certain period, such as a fiscal year. For physical documents, file parts are stored in physical folders or binders, which are labeled, usually bar-coded, stored in permanent locations, and moved to end users who request them.

File parts can contain both electronic and physical documents, so users can see the relationship between them as they work on a subject or case. Executing the Contents command on a selected file part displays its contents in another window.

In the version of RecordMANAGER we evaluated, the file plan doesn't allow bulk or global change or freeze, but it does support bulk import via DOCS Open's batch import function. When importing document batches, RecordMANAGER can capture summary data and directory structure information to use as indexes. Thus, the records manager can flag documents for archival and specify storage paths for archival and recovery.

As for retention and disposition, RecordMANAGER supports storage management schedules that define the items' lifecycle. Schedules are applied to files, so all file parts belonging to a file have the same storage schedule by default, although you can override for individual file parts. In the version we saw, paper and electric records are handled separately; RecordMANAGER controls the paper, and DOCS Open controls the electronic records. In the future, RecordMANAGER will control both.

The retention and disposal menu is used for archiving, transferring, and destroying records. Each function requests a date range, and then produces a report identifying all relevant items. In general, RecordMANAGER provides basic functionality for archiving, transferring, and destruction.

Physical documents differ from electronic documents in that they must be physically stored, and they require document movement tracking (as originals can only be in one place at any one time). Associated processes can be automated with bar-coding. RecordMANAGER supports bulk data entry functions for movement and return of files, and bulk placement of files in archive boxes. Thus, records administrators can identify a movement location and barcode-swipe a number of files to that location.

RecordMANAGER supports barcode technology via label printing, assignment of pre-printed labels to items, and single item or bulk data entry. For label printing, RecordMANAGER supports the output of barcode label information for documents, file parts, and archive boxes.

Through storage management maintenance, records can be designated as inactive, transferred, or destroyed. The system has two destroy methods for physical records, shred and recycle. Records can only be scheduled for destruction on a monthly basis, which is not granular enough. For deleting electronic records, RecordMANAGER intercepts the delete command to scrub the information from disk.

Borrow/Return functionality automates the records room. There is no notification capability that pushes that information to records managers about overdue records or records due for migration; administrators must actively look for this information by executing an "Overdue Items" report. Creating reports is somewhat confusing, and will be integrated with DOCS Open's reporting capabilities in the future.

End User Functionality

EDUCOM's focus is on decentralizing the records management function and on pushing the day-to-day tactical processes of filing and classification to the end users; specifically, to end users who are using DOCS Open. More than other RM products that we've seen that integrate with DOCS Open, RecordMANAGER's interface and the actions performed by the user are DOCS-like.

Every document in the RecordMANAGER system must be filed (registered) and classified at some point in its lifecycle. You register a document by profiling it in DOCS Open. Electronic documents and scanned images are registered on their first save. Physical documents are registered by executing the 'profile paper document' function from the DOCS Open desktop. RecordMANAGER can automatically capture required fields such as who created the record, when it was created, the application used, the document type, and the name/title of the record.

Classification occurs typically when you create the document. This function is part of the PC DOCS profiling step. For classifying, you get a drop down list, like Windows File Manager. But users cannot customize the interface or restrict security. There are five mandatory fields: title, type, actioned by, number, and application.

Paper Document Profile - New Document

Document

Title: Request for new payment method

Type: LETTER

Actioned by: Pat Lee

Keywords: QUARTERLY BILL, TRANSFER

Comments: From State Savings Bank, Account SSB-10023-A

Security

☒ Restricted

Profile Date: 9/02/98

File

Number: 97/0022/1

Title: Accounts

Household

Mr R Clayton, 54 Ocean St, Salem, MA

Location: Accounts - Bay 5

Storage Schedule: Seven Years

Borrower:

Figure 11 – RecordMANAGER Paper Document Profile Dialog

RecordMANAGER uses ODMA for ODMA-compliant source applications, like Microsoft Word. Global Link integrates any non-ODMA compliant source application with PC DOCS, like ABC Flowchart or Notepad. GlobalLink is a slick utility that fills the gap in the integration market for DOCS Open.

Users can profile (classify), search on anything (such as boxes or folders), mark items as read only (thus filing or declaring them as a record), request a document, or borrow and return.

For searching, RecordMANAGER leverages DOCS Open's strong search capabilities. For example, DOCS Open allows users to simultaneously search multiple databases and repositories with a single search, and it returns a single unified hit list of the results. These different databases can even be running on different servers and different operating systems.

DOCS Open allows users to save searches, and a "Quick Retrieve" function provides users with a list of the documents they have worked on most recently. DOCS Open also ships with standard query interfaces developed for specific industries and vertical applications.

E-mail integration is still somewhat limited. For users to add e-mail messages to the system, they must use the "Save As" function, which adds the message to the DOCS database. An e-mail message and its attachment are treated as a single record. Accessing the attachment requires first opening the message in the e-mail client application.

For Web users, RecordMANAGER depends on CyberDOCS, and provides basic user-level functionality. Users can select folders and choose where to put records (level one, two, or three). There is no error checking for closed/open files, and users cannot classify documents as records or search by content.

Strengths and Challenges

The following table summarizes RecordMANAGER's strengths and challenges.

Strengths	Challenges
?? Strategic and technical integration with DOCS Open; unobtrusively leverages and extends DOCS Open's strengths	?? Fate is tied to PC DOCS, and is one of several RM vendors fighting for PC DOCS' RM market share
?? Interface is simple and consistent, with EDMS-standard look and feel	?? Limited ability for staged implementations – customers require DOCS Open
?? Simplicity (e.g., for security)	?? No bulk change capability for doing massive changes to file plan
?? Unified document life cycle approach	?? Double handling of physical and electronic records for retention and disposition
?? Provides history information	?? Limited records center capability
?? Provides ODMA integration for source applications; includes Global Link module for non-ODMA source applications	?? Little flexibility in classification and security
?? Requires little administrator or user training for those comfortable with DOCS Open	?? No push at load time for past due or scheduled events, like migration and disposition

Table 15 – Strengths and Challenges: RecordMANAGER

Ideal Deployment

RecordMANAGER is best suited for the following types of applications:

- ?? You use DOCS Open, you want to extend it with records management capability, and DOCS is going to remain your organization's primary document system
- ?? Your primary need is for managing electronic records, and although you need to manage physical records, you only need basic records center functionality

Information Network, IN Inc. (InSight 32)

This section provides background information on Information Network, IN Inc. (IN), and presents Doculabs' analysis of the InSight automated records management system.

Company and Product Background

IN, based in Houston, Texas, was founded in 1982. Today, the company provides the InSight line of corporate electronic records management software applications and integration tools, as well as records management consulting and staffing services. InSight provides regulated organizations with corporate accountability for their paper and electronic documents, electronic mail, and other records.

The product's roots are in the private sector in industries such as energy, transportation, distribution, and other corporate enterprises. Current customers include large corporations and various regulated industries. IN integrates to publishing, imaging and content searching engines using OLE, DDE and API technology. Current development efforts include integration with 32-bit EDMS products.

The following table summarizes InSight's client, server, and database support.

Client Platform	Server Platform	Database
?? Windows 3.11 ?? Windows 95 ?? Windows NT	?? File, Database and Intranet server: Windows NT, Novell NetWare, or Banyan ?? Database Server: any platform supported by database	?? Microsoft Access (16 and 32 bit) ?? Microsoft SQL Server 6.5 ?? Oracle 7.3 + ?? ODBC-compliant

Table 16 – Client, Server, and Database Support

Doculabs evaluated a commercially available release of InSight 32. The server was installed on Microsoft Windows NT 4.0, running on Microsoft Access and Microsoft SQL Server 6.5 databases. Clients were running on Windows 95 and Windows NT.

Product Overview

The InSight family of products was designed to assist with the management of records and information resources. The system was built to locate and track physical and electronic records and to apply policy to record collections. An optional module uses OLE integration for viewing electronic documents associated with records. IN's experience in consulting and services informed (and funded) this product's development.

InSight and IN offer a number of strengths and value propositions. These include: ease of deployment and use (reduce the number of tasks and steps); strong corporate sector experience (not just government) and a large energy customer base; "talent, technique, and technology"; the maturity of the company; and vertical integration through InterLink.

IN employs Action Technology's conversation model for workflow. According to the model, customers initiate and negotiate requests for actions with a "performer." The performer fulfills the request by executing the action, and then sends the customer an acknowledgment. IN's strategy is to improve the records management process by targeting the request and acknowledgment stages for physical records, and by retrieving electronic documents via InSight's ability to transparently launch registered Windows applications or other integrated third party applications.

IN recognizes that many enterprises have localized records repositories, as well as active centralized collections. They also recognize that electronic records management systems are often bought as an interim departmental solution, but are eventually used across multiple departments. Thus, IN supports phased deployment, which is critical in most large organizations.

To address the need for an Internet/intranet solution, IN introduced InSight EveryWhere 1.0, which allows users to search for records via a Web browser. InSight EveryWhere was developed using Microsoft Visual InterDev, IIS and ASP. IN will continue to improve and support the client/server and Web products.

On the downside, new users who aren't familiar with records management will need to spend time learning the system. In addition, InSight's interfaces do not all share a consistent look and feel. The use of wizards and more intuitive interfaces would help reduce learning time.

Architecture and Components

InSight is a client/server records management system that processes requests at the server. There are three suites that may be used within InSight: the Main Suite, for end users; the Records Suite, for records managers; and the System Suite, for IT. The system can run in Windows NT, Novell NetWare, and Banyan networks. Clients connect to SQL databases via ODBC.

InSight ships with Microsoft Access as the database as well as the back-end graphic user interface utility. Because Access has such broad market penetration, chances are good that customers will not need to add a database administrator or specialist for installation and maintenance of the InSight database. Providing a turnkey RMS tool with an Access back-end means that IN can more easily secure a foothold at client sites, bypassing the bureaucracy associated with the IT approval process. Access can also provide a good first pilot before migrating to ODBC databases.

While it is true that current versions of Microsoft Access are a vast improvement on their predecessors, Access is not an enterprise database solution. Fortunately, InSight is also compatible with SQL databases, and the company recommends using a SQL database for systems of more than 20 users or databases of more than 50,000 records. At this stage, of course, you'll need IT resources, including assistance from a database administrator.

With increasing client-side interaction for electronic records management, RMS products require more robust back-ends, and a middle tier to broker database connectivity and reduce the client footprint. InSight has made strides in this direction with SQL database support and the release of the 32-bit solution. InSight also offers a three-tier Web solution called InSight Everywhere, which provides direct access to InSight 32.

Capabilities

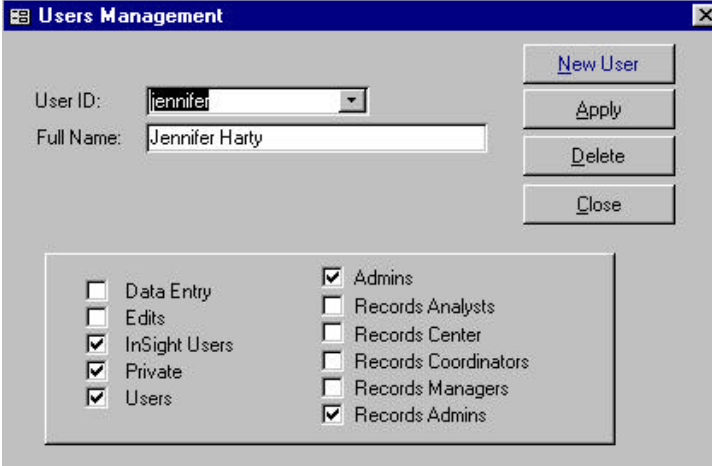
This section describes the functionality of InSight, in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

For setting up the system, InSight offers the System Suite. This module allows administrators to create user IDs, assign roles, and set up security. Although the module is functional, our analysts found the screens in the System Suite to be confusing.

SQL Database objects are created by running a script supplied by IN Inc. Scripts are customizable by database administrators. Once the script is run, users are set up at the database level and then within the application. The administrator then assigns roles to users. Security is based on the roles and privileges within the application and rights at the database-table level. Security is not integrated with the network operating system.

InSight's use of roles is impressive. The application comes with 10 predefined roles, and users may have a combination of roles. Packaged roles include requestor roles (InSight users who can search, request, request to add, view, and print reports), performer roles (such as data entry, records center staff, records coordinators, and records analysts that contribute policy updates and initiate policy-driven destruction processes), and administration roles (for database and user management functions).



The screenshot displays the 'Users Management' window. It features a 'User ID' dropdown menu with 'jennifer' selected, and a 'Full Name' text field containing 'Jennifer Harty'. To the right are buttons for 'New User', 'Apply', 'Delete', and 'Close'. Below these is a list of roles with checkboxes. The roles and their selection status are: Data Entry (unchecked), Edits (unchecked), InSight Users (checked), Private (checked), Users (checked), Admins (checked), Records Analysts (unchecked), Records Center (unchecked), Records Coordinators (unchecked), Records Managers (unchecked), and Records Admins (checked).

Role	Selected
Data Entry	<input type="checkbox"/>
Edits	<input type="checkbox"/>
InSight Users	<input checked="" type="checkbox"/>
Private	<input checked="" type="checkbox"/>
Users	<input checked="" type="checkbox"/>
Admins	<input checked="" type="checkbox"/>
Records Analysts	<input type="checkbox"/>
Records Center	<input type="checkbox"/>
Records Coordinators	<input type="checkbox"/>
Records Managers	<input type="checkbox"/>
Records Admins	<input checked="" type="checkbox"/>

Figure 12 – Users Management Interface

Records Manager Functionality

For people who provide records services, InSight provides the Records Suite. This entrance offers good RM functionality, although it is stronger for physical records management than for electronic records management at this time.

The file plan is flexible. To create a file plan, a Records Analyst must create the class. The Work Group View optional module allows the Records Administrator to parse the collection by class and other elements to present users with only the information they need to see. The form designs can incorporate custom field naming conventions.

Once a file plan is created, modifications are made using the same graphic interface used to setup the original plan. Records can start at the folder or document level that can transfer or incorporate container index such as box or carton identity. The database has multiple fields and supports custom templates. The repository includes an acronym table for all fields and a long name/short name feature for storing code definitions and data entry standards. InSight's optional InterLink module adds support for database extensions.

The screenshot displays the 'Request to File' window with the 'Records Suite' tab selected. The interface includes a menu bar with 'DataSheet', 'Send', 'File', 'Add', and 'Close'. Below the menu, there are several input fields and sections:

- Class ID:** A dropdown menu showing 'Employment' and 'Application'.
- Title 1:** A text field containing 'Mary Smith'.
- Title 2:** An empty text field.
- Old Title:** An empty text field.
- Published By:** An empty text field.
- Source:** A dropdown menu showing 'Personal Refer'.
- Begin Date:** A date field showing '2/24/98'.
- End Date:** A date field showing '12/31/98'.
- Date Created:** A date field showing '2/24/98'.
- Status:** A dropdown menu.
- Custom 1:** A text field.
- Custom 2:** A text field.
- Description:** A text field.
- Keywords:** A text field.
- Private:** A checkbox.
- Assigned Location:** A text field.
- Current Location:** A text field.
- Box ID:** A text field.
- Box Barcode:** A text field.
- Instruction:** A text field containing 'emeka, please add.'
- User:** A text field containing 'jennifer'.
- Confirm File as is:** A checked checkbox.

At the bottom, there is a 'Record:' label and a navigation bar with buttons for 'Previous', 'Next', 'First', and 'Last', along with a page indicator '1 of 2'.

Figure 13 – Request to File Interface

InSight provides an optional space management module that can track location, container type, equipment type, address information, and space inventory in large containerized collections (e.g. over 20,000 boxes). This is helpful for tracking down the exact location of a folder, tube or box used to store records.

Space Inventory

InSight™
AUTOMATED
RECORDS MANAGEMENT SYSTEMS

Gen. Equip. **New** **Close**

Description:

Equipment #: **Equipment ID:** **# Shelves:** **Equipment Type #:**
1 565 1 1 ...

Equipment Serial #: **Location ID:** **Site:**
456 1 ... houston

Shelves

Shelf #: **Shelf ID:** **Shelf Capacity:**
1 1 6

Shelf Container Type:
plastic

Additional Equipment: **Additional Personnel:**
forklift ☒

Address:	Shelf ID:	Used:
houston-1-1	1	-1
houston-1-1	1	-1
houston-1-1	1	-1

New Shelf **Delete** **Gen. Shelf**

Record: 1 of 21

Figure 14 - InSight Space Management Module

InSight allows costing and provides an activity graph, as well as tracking when rules and regulations change. InSight also earns high marks for its integration with reporting tools. Using any third party reporting utility, users can query the SQL-compliant InSight system and build custom reports. InSight ships with a number of default reports.

Another impressive optional module is InterLink. This component allows records manager visibility into collections, and to integrate processing with other databases. This allows line-of-business databases to be programmatically integrated with the records management database. The InterLink module includes a charge-back report.

End User Functionality

InSight excels in the way it connects user functionality and records manager functionality, focusing on requests and acknowledgments. The Main Suite enables all end user actions, searches, and acknowledgments. The interface has a tabbed navigation approach, and it allows users to style their own search forms and result-list preferences for rows and columns.

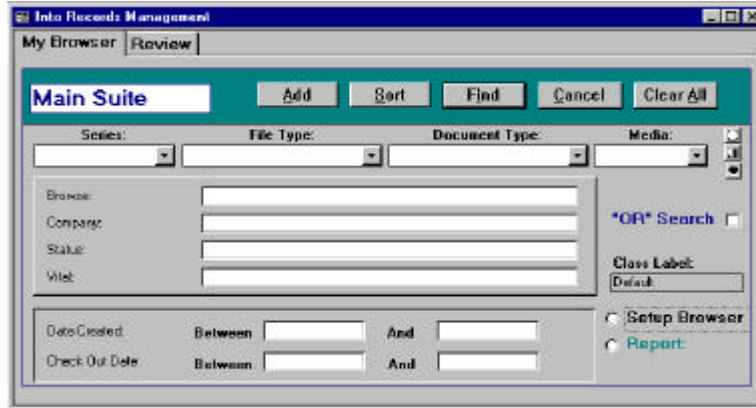


Figure 15 - InSight's Main Suite

With the SQL version of InSight, the query processing takes place on the server. With the Access version, the full query set is transferred to the client for processing. InSight allows all users to save common searches.

Like most RMS products we have seen, InSight's end user interfaces still need to be simplified and provide a more consistent look and feel. For example, the Main Suite's acknowledgment screen for requesting records appears somewhat dated (i.e. Windows 3.x). Fortunately, administrators can easily add custom help to every field, minimizing IT support needs.

Viewing records on-line with InSight requires use of the viewers and applications available in the workstation's Windows registry. The product does not provide a packaged viewer. InSight allows users to request to add new records to the repository, and offers a feature called InterFile to let users specify the folder destination of a physical document update.

IN provides a Web browser interface, InSight Everywhere. The interface enables searches, requests, and requests to add. Users can customize their interfaces and access them from any menu. The current version does not support viewing of electronic documents (they must be e-mailed).

Strengths and Challenges

The following table summarizes InSight's strengths and challenges.

Strengths	Challenges
<ul style="list-style-type: none">?? Open architecture, integrates with third-party reporting tools?? Microsoft Access back-end reduces IT resource requirements?? Modifiable user search forms leverages registry?? Classification methodology and programmatic re-classification?? Holds can be applied by classes and within classes?? Leverages operating system and desktop functionality; uses Windows registry for electronic documents?? InterLink enables the system to invoke external programs and modules?? Web client can access database directly?? Support for distributed architecture?? Certified integration to RetentionManager, a leading retention research database	<ul style="list-style-type: none">?? Administration module seemed confusing at first, with too many interfaces?? Web client is still basic (it supports search, request, and requests to add)?? Currently provides only basic capabilities for handling electronic documents?? No native viewing support

Table 17 – Strengths and Challenges: InSight

Ideal Deployment

InSight is best suited for the following types of applications:

- ?? You need a robust client/server RMS for a departmental deployment
- ?? You need to extend the RMS to multiple departments (perhaps geographically distributed), with each group keeping separate records inventories and repositories
- ?? You need strong management for physical records and space
- ?? You need to minimize IT resource requirements
- ?? You need to have RMS integrated to a retention research database

Provenance, Inc. (ForeMost 6.3 and 7.0)

This section provides background information on Provenance, Inc., and presents Doculabs' analysis of the ForeMost records management system.

Company and Product Background

Provenance, Inc., based in Ottawa, Canada, was founded in 1989. The company provides the ForeMost line of corporate electronic records management software applications and integration tools. ForeMost provides regulated organizations with corporate accountability for their electronic documents, electronic mail, and other records. ForeMost 6.3 was developed to be compliant with the DoD 5015.2 specification.

Provenance has a strong research and development focus, and has done significant work in redesigning the science of records management to effectively manage both electronic and paper records. The product's roots are in the National Archives Canada and other governmental agencies; current customers include government agencies, large corporations, and various regulated industries. Provenance's strategic software partners include PC DOCS, FileNET, Open Text, Jetform, and Lotus.

The following table summarizes ForeMost's client, server, and database support.

Client Platform	Server Platform	Database
?? Windows 3.11 ?? Windows 95 ?? Windows NT	?? File Server and Document server: Windows NT or Novell NetWare ?? Database Server and Search Server: any platform supported by database	?? Oracle ?? Microsoft SQL Server ?? Sybase ?? SQLBase

Table 18 – Client, Server, and Database Support: ForeMost

Doculabs evaluated a commercially available release 6.3 and a pre-release version of ForeMost 7.0. The server was installed on Microsoft Windows NT 4.0, running a Microsoft SQL Server 6.5 database. Clients were running on Windows 95 and Windows NT.

Product Overview

With ForeMost, Provenance's strategy is to provide an RMS that can control the final stages of the document life cycle: retention, archival, retrieval, and disposition. ForeMost is the first RMS product to meet the U.S. Department of Defense's DoD 5015.2 certification. With this certification under its belt, Provenance will aggressively pursue business with the U.S. government.

A key differentiator for ForeMost is its focus on electronic records. With the emergence of EDMS solutions as a major source and custodian of all documents, Provenance designed its system to integrate tightly with EDMS products. In fact, Provenance currently integrates its ForeMost system to three of the leading DM vendors: PC DOCS, FileNET, and Open Text. ForeMost can map metadata from the DM system right into the RMS repository.

From a product standpoint, ForeMost has tailored its product for end users who have little or no records management experience. As end users create most of the electronic documents within corporations, it makes sense to give them the ability to classify those documents and to search for records in the repository. In addition, ForeMost is the first RMS product that offers a Web-based thin client, which will put the technology in the hands of more users.

In terms of implementation, ForeMost uses a toolkit approach. ForeMost has a powerful API toolkit to integrate with third-party products, which is part of ForeMost's strategic direction to be open for integration with other systems.

A key advantage of ForeMost is the ability to roll it out in a staged implementation. For example, ForeMost can be used as a stand-alone system for paper records, or for both paper and electronic records. The system can later be integrated with a DM system such as PC DOCS, Open Text, or FileNET's Panagon IDM Document Services (formerly Saros).

Architecture and Components

The ForeMost server components run on Windows NT or Novell NetWare. The database and search servers run on their native platforms. The ForeMost client supports all Windows platforms.

The ForeMost architecture is a typical two-tier, fat-client configuration, in which clients connect to the relational database. While functional, this architecture has limitations in terms of scalability and performance for large numbers of connections and heavy usage.

ForeMost's major components are the file server (which can be Novell NetWare or Windows NT), the document server, and the database server. For records managers, users, and administrators, the main points of access are the ForeMost client and a separate administration utility.

The file server contains all the ForeMost executable files for shared access (although they may also be stored locally on workstations). The database server contains the relational database, which stores system information and record indexes for all records, both paper and electronic. Clients connect to the database via ODBC.

The document server is typically used to store electronic documents, although they can be stored directly in the database as BLOBS (Binary Large Objects) – not a recommended approach for large databases or large numbers of users). The document server also contains Fulcrum SearchServer for full-text indexing and searching.

For records managers and users, the ForeMost client application provides the ability to file records, classify them, request and retrieve records, and search the records repository. ForeMost also includes a Web browser-based interface. ForeMost provides a separate administration client for system configuration and records management setup.

ForeMost provides gateways for integrating with specific EDMS products, including PC DOCS, FileNET Panagon IDM Document Services, Open Text, and Lotus Notes. It also integrates with Microsoft Exchange and Dyn Solutions's CIMS. On the hardware side, ForeMost requires no proprietary hardware. The system supports portable bar code readers, and can interface with microfilm readers, optical storage systems, scanners, and fax systems.

Capabilities

This section describes the functionality that ForeMost provides, in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

We installed ForeMost by first installing the database server, then installing the document server (which included Fulcrum SearchServer and ForeMost Enterprise Document Server). Next, we configured each workstation, which required the document viewer OCX and Search Server ODBC driver. Finally, we ran a configuration routine to initialize the ForeMost 6.3 database.

Overall, system setup is relatively complex, and will require the involvement of IT personnel. For example, manual configuration of settings is required, as is knowledge of database systems and enterprise resources.

The system does not provide much integration with the operating system, such as leveraging the user and group definitions or security in Windows NT. However, Provenance maintains that access rights will be different for the RMS than for other business applications, so integrating with the operating system is less of an issue. Still, integration with the operating system would save time for the administrator, especially for large systems with hundreds or thousands of users.

ForeMost provides a developers toolkit, a set of APIs that allow developers to build filing, classifying, and retrieval processes into other systems or business applications. This permits these essential end user RM functions to be incorporated in any desktop.

Records Manager Functionality

Provenance stresses its ability to provide end users (front office workers) with records management functionality. Consequently, ForeMost historically has not been as strong in functionality for back-office records managers, who need to manage paper as well as electronic records. However, ForeMost 7.0 is much improved over previous versions. The system now includes great capabilities for managing electronic records and good functionality for paper records and folders. ForeMost includes helpful automation utilities such as bulk import, update, and export.

Records management functions are accessed through a set of interfaces for various actions. This makes the tool complex – we were looking for a single access point into the system, or better uniformity among interfaces (for experienced records managers, this problem may be less of an issue).

To manage the filing system, ForeMost allows managers to set up a structure for records, documents, and folders. The flexible system includes customizable key table fields. In addition, the reorganizer supports massive global changes to the filing system. For example, managers can promote tertiary categories, bolting them to primaries as secondaries.

Setting up retention and disposition schedules is complex, but there is flexibility in how disposition is calculated. For example, ForeMost offers chronological and conditional disposition, and dates can be rounded up or down (such as to month's end). Once a schedule is established, records managers can assign the retention schedule (via file retention code) to files and folders in the system. Records managers can also place certain records "on hold," which freezes them from the disposition schedule.

ForeMost 7.0 is much improved in its ability to manage inactive paper records. The system tracks changes in box locations, even if boxes are stored off-site. The product also tracks inactive file migration, which involves moving documents into folder and folders into boxes. However, ForeMost offers no space allocation or shelving management capabilities.

To migrate electronic records, ForeMost moves the electronic files and their profiles to a temporary directory, then copies it to a long-term archive (typically tape). For destruction of electronic records, ForeMost overwrites the relevant disk sectors 17 times to ensure complete deletion.

Most EDMS products cannot ensure complete deletion in this fashion – PC DOCS, for example, can only delete the pointers. ForeMost must reach through PC DOCS to do the physical overwrite and delete in order to comply with the DoD 5015.2 specification that the data be unrecoverable.

For security, ForeMost enables different levels of access control based on documents, users, groups, and prefixes (portions of the file system). Managers can set up exclusion lists to restrict groups from certain items.

ForeMost logs a variety of system information, including access history. ForeMost includes an internal report writer, which generates database reports based on templates that use the most common tables in a ForeMost database. ForeMost can also be used with third-party reporting tools.

For records managers, ForeMost's integration with EDMS products is significant. Through its EDMS gateways, ForeMost allows users to declare and classify EDMS documents as records in the RMS. The EDMS and RMS profiles for a document can be mapped together, so actions in the RMS (such as locking a file or changing its status) can update the EDMS.

No other product we've seen offers this level of integration with EDMS products. Records managers even have the choice of storing electronic documents within the EDMS and synchronizing with it, or actually transferring the documents into ForeMost. While EDMS administrators may be reluctant to turn documents over to the RMS, it makes sense for inactive documents and saves space in the EDMS.

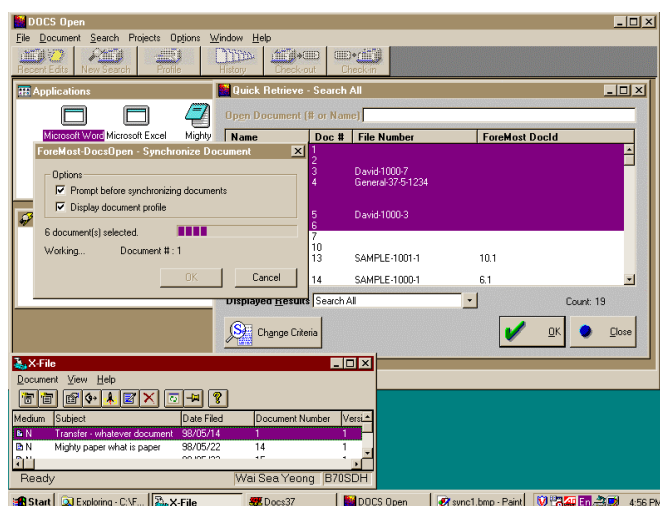


Figure 16 - Synchronization Between PC DOCS and ForeMost

End User Functionality

End user functionality is a key area in which ForeMost really excels. More than other RMS products, ForeMost is focused on putting RMS into the hands of users who may not be familiar with records management.

The product's goal is to make it as easy as possible for users to declare and classify records according to the organization's file plan. Users can declare and classify records from the ForeMost client, from within a source application (such as Microsoft Word or e-mail), or from an EDMS application.

The ForeMost client interfaces provide the ability to search both electronic and paper records. Users can submit requests for records, reserve documents that are already charged out, and view electronic records (via the Inso viewer). Unfortunately, users must use different executables and interfaces to perform different actions, which can be confusing.

Users can file their records in a variety of ways: through the main ForeMost module, via e-mail, via drag-and-drop, through desktop applications, via an EDMS gateway, or from a Web browser. Most users opt for the desktop application, while records managers typically use drag-and-drop or the main module.

With ForeMost, users can classify their records using a personal selection list, which can be based on the user's permissions or utilization frequency. Users can also navigate the entire file plan, or search the file plan by subject or description.

Records managers can define profile templates that make it easier for users to file documents. Users can also file e-mail messages, which is a helpful feature, although ForeMost stores attachments separately from messages. ForeMost does embed all linking information to connect messages and attachments.

For Web users, ForeMost provides the ForeMost/Inet (formerly Odyssey) browser interface that allows users to file, classify, and search for records via a browser. While helpful for users, ForeMost does not yet offer records managers full functionality via the Web. The interface converts all documents to HTML, but does not yet provide a native document viewer.

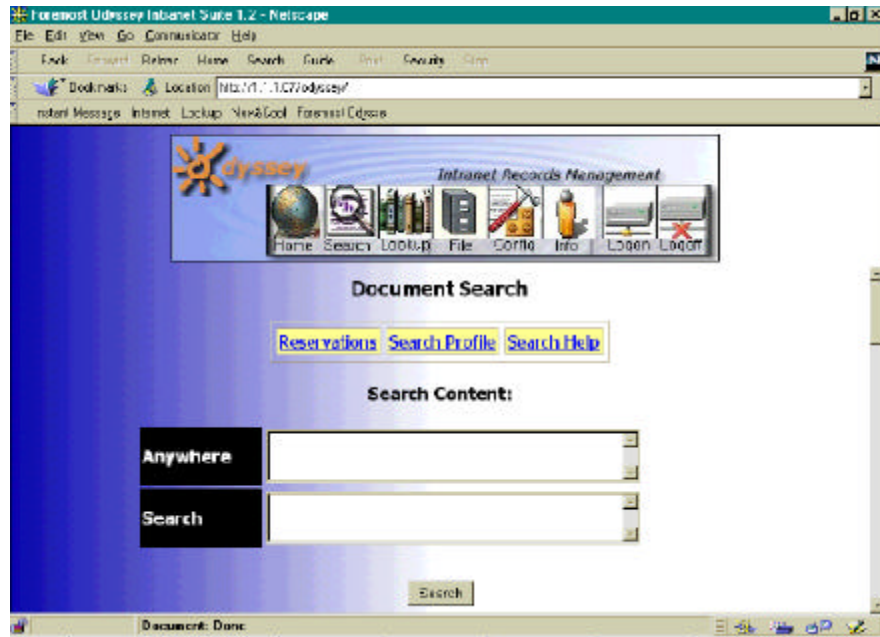


Figure 17 - Provenance Odyssey Web Client

Strengths and Challenges

The following table summarizes ForeMost's strengths and challenges.

Strengths	Challenges
?? Very good at managing electronic records, and much improved for paper records	?? Architecture is two-tier, fat client; does not integrate with the operating system
?? Provides staged, flexible implementation (records management only, or records management and DM)	?? EDMS integration is via gateways, which are product- and version-specific
?? Bulk update feature simplifies records manager's tasks	?? Cannot apply retention and disposition down to the folder level
?? Supports multiple EDMS vendors; has alliances with FileNET, PC DOCS, and Open Text	?? Interfaces are not intuitive; no single point of access
?? Provides Web support, with a true thin client	?? Web approach is HTML-based, and does not yet leverage more advanced Internet technologies
?? On its way to becoming an RMS module within EDMS applications	

Table 19 – Strengths and Challenges: ForeMost

Ideal Deployment

ForeMost is best suited for the following types of applications:

- ?? Your current need is for records management only, but you want the flexibility to integrate with an EDMS in the future
- ?? You want an EDMS with records management functionality (as opposed to an RMS with some EDMS functionality)
- ?? Your organization uses more than one EDMS product, and you want a single RMS that can integrate with them
- ?? You want to access the RMS via Web browsers

PSSoftware Solutions Inc. (RIMS Studio 6.0)

This section provides background information on PSSoftware Solutions Inc., and presents Doculabs' analysis of the RIMS Studio records management system.

Company and Product Background

PSSoftware Solutions Inc., based in Ottawa, Ontario, was established in 1986. The privately-held company released its first version of the RIMS records management solution in 1988. Today's Windows-based version of RIMS is designed to manage heterogeneous records and documents across the enterprise.

PSSoftware claims to have a majority of the current install base of records management software within the Canadian Federal Government. Although the product's heritage is in government deployments, PSSoftware is now used in a broad range of industries, such as manufacturing, legal, utilities, and telecommunications. PSSoftware sells its software direct, and typically provides services along with a RIMS software sale.

The following table summarizes RIMS Studio's client, server, and database support.

Client Platform	Server Platform	Database
?? Windows 3.11	?? Windows NT	?? Oracle
?? Windows 95	?? Novell NetWare	?? Microsoft SQL Server
?? Windows NT	?? Database server: all platforms supported by database	?? Sybase
		?? SQLBase

Table 20 – Client, Server, and Database Support: RIMS

Doculabs evaluated RIMS Studio 6.0. The server was installed on Microsoft Windows NT 4.0, running a Microsoft SQL Server 6.5 database. Clients were running on Windows 95 and Windows NT.

Product Overview

RIMS Studio is an integrated suite for corporate records management applications. The system provides all the functionality required for tight records management control and access. The system provides out-of-the-box integration with PC DOCS and FileNET document management systems, as well as e-mail and report writers. The system can also be integrated with EDMS products such as workflow or imaging systems.

RIMS Studio provides a core set of utilities to handle the full complement of records functions, automating an organization's legal, audit, and regulatory obligations. Through components such as the RIMS File Manager, Storage Manager, and Retention/Disposition Manager, records managers can easily perform their daily functions within the RIMS system.

Responding to the recent trend to involve users in the records process, PSSoftware provides the RIMS Navigator utility to allow users to search for records and to send retrieval requests. For users that need to perform functions such as record declaration and classification, PSSoftware can also build custom client interfaces that make the process simple and foolproof. These "wizards" walk users through the specific steps that they need to perform, which helps automate best practices and eliminate errors.

The original RIMS system was designed to handle paper records, addressing the needs of records managers. Today, RIMS Studio is focusing on extending the system to end users as well. This means a new set of requirements, particularly the ability to manage electronic records.

RIMS Studio currently addresses electronic records management through partnerships and integration with PC DOCS (DOCS Open) and FileNET (Panagon, formerly Saros). RIMS Studio offers out-of-the-box integration with these DM solutions, providing the ability to manage both electronic and paper records via the RIMS Studio interface in a consolidated fashion. RIMS also integrates with the Eastman Software image viewer.

In the future, PSSoftware plans to provide basic capabilities for managing electronic documents within the RIMS system. This will be accomplished through integration with Windows NT 5.0's basic file and DM capabilities. With this enhancement, PSSoftware will not be dependent on an EDMS system in order to handle electronic records.

Architecture and Components

RIMS Studio is a 32-bit client/server system that runs in a Windows environment. All profile information, file plans, user information, and system information is stored in the RIMS database, which can run on a variety of relational databases. The system uses a two-tier architecture, with most of the system processing taking place on the client.

RIMS Studio consists of four stand-alone components that can be run on any machine. The components are File Manager, Storage Manager, Retention/Disposition Manager, and the RIMS Navigator.

The File Manager is the component that manages active records. It allows records managers and users to declare and classify records, apply disposition schedules, search, and see the location of a record. File Manager also includes charge-in and charge-out functions for records.

The Storage Manager is the component that manages inactive records. The Storage Manager tracks all the information about the archived records, their locations, and the available free space within your storage facilities. This utility allows the records manager to instantly see where various containers are located, and to generate reports based on total and free space. This is a very useful tool for space management and allocation.

The Retention/Disposition Manager minimizes risk by allowing records managers to define retention and disposition rules and schedules, and to apply those rules to a records series. This ensures that records are saved only as long as required, and then systematically flagged for disposition.

The RIMS Navigator is the end user's main interface, allowing users to view records, search for records, save and re-execute queries, and send requests to the records manager. For users who need advanced features, such as the ability to declare and classify records, PSSoftware will develop a custom "RIMS Wizard" interface that makes the process simple for users. For integration with outside applications, RIMS provides an API.

For security, the system provides logon security, as well prefix security that restricts users from certain classification structures. All files, folders, and documents are assigned a security level, which keeps certain users from accessing them. Users can be restricted from some system functions.

Capabilities

This section describes the functionality that RIMS Studio offers in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

With RIMS Studio, workstation setup is fairly simple, and a wizard guides administrators through the process. Or, administrators can set up the installation executable on the network, and e-mail users a shortcut to the installation. Users click on the shortcut to install the client software.

System setup also requires installing a relational database and setting up users, groups, and security. RIMS Studio recently added an installation routine that eliminates the need for administrators to modify initialization files during the setup process. User logons can be synchronized with Windows NT, simplifying life for both users and administrators.

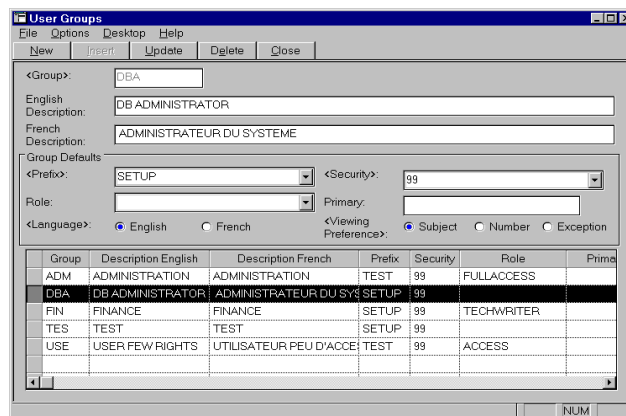


Figure 18 - User Groups Window

Administrators can assign security at the user level, record or prefix level, and function level. The ability to restrict users from certain functions is valuable, but there is no way to hide disabled functions. This is distracting, as users who click on disabled functions receive error messages.

RIMS Studio provides many helpful administration features. The system exposes parameters to the Windows NT Performance Monitor, allowing administrators to monitor the system using familiar utilities. The system creates a full audit trail that can be used for later analysis. In addition, a re-login button allows the administrator to login as another user for testing.

Records Manager Functionality

For records managers, RIMS Studio is a great solution. The system makes it easy for records managers to set up file classifications systems, control files, set retention schedules, and perform basic administration functions.

A separate administration utility allows records managers to set up the organization's file plan, and to create "patrons" (users that only have charge-out rights), roles, and assign functions. The interface is extremely flexible, and allows records managers to set many options and give individual users access to exactly the functions they need.

However, with so many flexible options, the administration interface is confusing. For example, assigning functions to users requires you to scroll through a list of over 500 functions, selecting the pertinent ones. These functions are not documented, and there are no default templates or packaged groups of functions for specific user types.

For actually managing active records, RIMS Studio provides the File Manager utility. This utility is the primary interface for declaring and classifying records, applying disposition schedules, searching, and creating reports. This utility allows managers to build and enter metadata for specific files, create and print labels with bar codes, and generate a classification manual and file inventory listing.

The screenshot shows the 'File Details' window in RIMS Studio. The window has a menu bar with 'File', 'Edit', 'Options', 'Case', 'Desktop', 'Tools', and 'Help'. Below the menu bar is a toolbar with buttons for 'New', 'Insert', 'Codes', 'Update', 'Responsible', 'Notes', 'Keywords', 'Folders', 'Documents', and 'Close'. The main area is divided into two columns. The left column contains fields for: '<Prefix>' (LEGAL), '<File Number>' (100-2), '<File Security>' (UNC), '<File Type>' (CAS), '<Essential>' (YES), '<Storage>' (PAP), '<Date Created>' (1997-09-24), '<File Status>' (ACT), 'Subject English' (Acts and Legislation - Access to Information Act), 'Description English' (General requests for information from the Public and Government sector), and 'Country' (CAN). The right column contains: 'Classification' (LEGAL | Legal Department, 100 | Administration, 100-2 | text, 100-2 | Acts and Legislation), '<Status Date>' (1997-09-24), 'Subject French' (empty), 'Description French' (empty), and checkboxes for 'Hold Flag' and 'Notes'. At the bottom right, there is a 'NUM' button.

Figure 19 – Entering Metadata for a File

File Manager provides very good searching capabilities. Besides offering wild cards and multi-selection drop-down boxes, it also allows private, friendly names for search criteria. It also allows you to save and share searches with others who meet the access criteria.

File Manager provides capabilities to make life simpler for records managers. For example, the system has batch functions for keywording, box to folder, charge-out, put-away, and label generation (with 115 default label definitions). For reporting, the system integrates with Crystal Reports.

RIMS Studio provides the Storage Manager for tracking inactive records and the space used by both managed and non-managed facilities. Storage manager manages and tracks boxes, their contents, and available free space. Records managers can instantly see where various containers are located, and generate reports based on total and free space. We were impressed by the space management capabilities and by the interface.

The Retention/Disposition Manager allows records managers to define retention and disposition rules and schedules, and to apply those rules to a records series. This ensures that records are preserved only as long as required, and then systematically scheduled for disposition. The module is designed to be unobtrusive and transparent, and it largely succeeds.

Retention schedules are applied either at the Primary or File level, as well as through Record Series Identifiers (RSI) that can be reused to apply the same rules across objects, regardless of file classification. The RSI model is integrated with the Skupsky methodology for retention and disposition.

Though RIMS Studio is designed to handle paper records, it can also handle electronic records through its packaged integration with PC DOCS and FileNET. When used in conjunction with these DM systems, RIMS Studio provides users with one consolidated interface for both paper and electronic documents. Of course, this means you must purchase and install one of these DM solutions in order to manage electronic records.

Overall, RIMS Studio is well-suited for the records management process. It can handle boxes and folders, it has good retention and disposition, and it has impressive storage management and space allocation capabilities. But RIMS Studio too many interfaces with too many choices (a future version will provide a single access point and simpler front-end).

End User Functionality

For end users who are not records manager, the RIMS Navigator is the main interface into the RIMS system. Through the RIMS Navigator, users can view records in a variety of ways, and can allow users to see which people have charged-out specific records, and to see recall data.

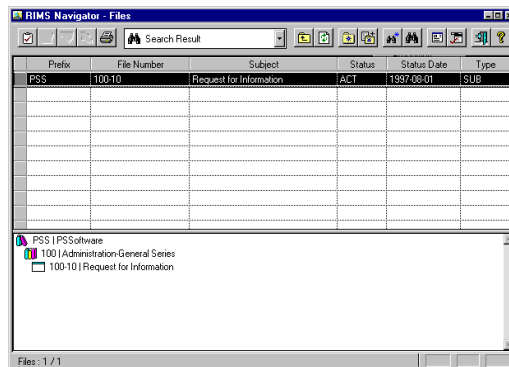


Figure 20 – RIMS Navigator

The RIMS Navigator also allows users to search for records using a simple search interface. Users can search across multiple databases, save their queries for re-execution, and share searches with other users. Once users locate the record they need, they can submit a retrieval request directly to the records manager via e-mail. RIMS Studio also allows users to pass records directly to other patrons who want them, rather than passing them back to the records manager first.

For end users who need more advanced functionality than just searching and requesting, PSSoftware develops custom “RIMS Wizard” interfaces that make it simple for users to accomplish their tasks. For example, a Wizard client can walk users through the process of creating new folders and declaring and classifying records in an appropriate manner.

If your application includes electronic records, chances are that the end user will be doing the classification. This is done via integration with PC DOCS or FileNET’s document management systems, which can handle all electronic documents, including e-mail messages.

For Web access, PSSoftware’s initial offering is an HTML-based search-and-request interface. Subsequent versions will incorporate additional features that are found in the client/server version of the RIMS Navigator.

Strengths and Challenges

The following table summarizes RIMS Studio's strengths and challenges.

Strengths	Challenges
?? Broad range of features	?? Flexibility means that the interfaces are extremely complex, with many options and many choices
?? Good flexibility to set up the system any way you want	?? System will require training
?? Ability to provide users with only the features they need	?? Can only handle electronic documents through integration with third-party EDMS tools (electronic records management is scheduled for an upcoming release)
?? Easy installation	?? Beta Internet offering is functionally limited (provides only basic capabilities)
?? Strong strategic partnerships (PC DOCS, FileNET)	

Table 21 – Strengths and Challenges: RIMS Studio

Ideal Deployment

RIMS Studio is best-suited for the following types of applications:

- ?? You need to manage the complete life-cycle of paper-based records, and you have basic space allocation needs
- ?? You have or will have PC DOCS or FileNET for electronic DM, and you want to integrate records management
- ?? You need a good architecture and a sound strategy for integration with Windows NT, and you may deploy paper-based records management throughout your enterprise
- ?? You want to add value to your corporate records repository by adding metadata about your records, and you want to manage your risk and accountability
- ?? You need to start by managing critical records, with the ability to extend the system to end users in the future

TOWER Software (TRIM 4.1 and 4.2)

This section provides background information on TOWER Software, and presents Doculabs' analysis of the TRIM records management system. Although TRIM provides DM and workflow functionality, this review focuses primarily on its records management capabilities.

Company and Product Background

TOWER Software, based in Australia, was founded in 1985 as a software research and development company providing records and document management applications. The company's product TRIM is distributed by TOWER Software Corporation to the US market.

TRIM enables organizations to manage electronic and paper objects, and most importantly, to apply sound RM principles to all records. TRIM's roots are in records management for the Australian government and the public sector. Current customers include government agencies, large corporations, universities, and various regulated industries. TOWER Software is credited for ISO 9000 standards and is a certified Microsoft developer. TRIM is Microsoft Back Office certified.

The following table shows TRIM's client, server, and database support.

Client Platform	Server Platform	Database
?? Windows 3.11 ?? Windows 95 ?? Windows NT	?? Document server: Windows NT, Novell NetWare, or any OS providing FTP services (e.g. UNIX) ?? Database server: any platform supported by database	?? Oracle ?? Microsoft SQL Server ?? Sybase ?? SQLAnywhere ?? Informix ?? IBM DB2 ?? ISAM

Table 22 – Client, Server, and Database Support

Doculabs evaluated a commercially available release of TRIM 4.1. The database was installed on Microsoft Windows NT 4.0, running TOWER's ISAM database or Microsoft SQL Server 6.5 database. Clients were running on Windows 95 and Windows NT. We also assessed a pre-release version of 4.2.

Product Overview

TOWER Software views records management as a function that must play a role in any or all parts of the document life cycle, not just at the archival stage. This is known as “active records management.” The company’s strategy is to shift its focus from paper records to both electronic *and* paper records.

TOWER is pursuing its document life cycle strategy for records in two ways. First, it offers a records management solution with basic DM and workflow capabilities for those administrative business functions that require it. Second, although TRIM has EDMS functionality, it is integrated with PC DOCS. It is also integrated with IBM VisualInfo, CVSI Optegra, and TOWER Technology digital stores, making the documents and corporate records available to line-of-business applications.

TOWER’s other strategic partners include IBM, CVSI, and TOWER Technology (a similarly named but unrelated company specializing in imaging systems). In partnership with IBM, integration between TRIM and Lotus Notes is expected later in 1998.

TOWER has built the TRIM system to be deliverable, with minimal development costs and end user complexity. It has been designed to be easy to install and simple to use, with a single interface into all records within an organization, and with basic DM and workflow functionality. Through the strategic alliances mentioned above, TOWER seeks to provide total solutions to its customers.

TOWER’s TRIM has been certified in compliance with the U.S. Department of Defense’s DoD 5015.2 certification. With this certification under its belt, TOWER will aggressively pursue business with the U.S. government.

Architecture and Components

TRIM uses a 32-bit, two-tier client/server architecture. The product consists essentially of two parts: the application and the database. All TRIM application components run on TRIM clients, which support Windows 3.x, Windows 95, and Windows NT. The system can use a number of different databases on a variety of platforms, and can be run on a TRIM client or a separate workstation. Systems can include multiple repositories.

Although most TRIM desktop activity occurs on the client, TRIM includes an event processor where some processing may be performed in the background on a workstation client rather than a database server. The workstation acts as a background event server. While performance may not measure up to stored procedures on a database server, TRIM's approach is easier to maintain and is not proprietary to the database.

Overall two-tier architecture will probably not pose limitations in traditional records management systems that have few connected users. In fact, the system will be simple to maintain for a small set of users, and will limit the involvement of IT groups. However, as records management systems evolve into systems that end users access (especially for electronic records management), the scalability of the two-tier architecture may be a limiting factor.

TRIM is ODMA-compliant, allowing users to file and classify documents directly from most desktop applications. TRIM also has an API set which TOWER is publishing in version 4.2 for use by organizations for integration. The system uses a proprietary search engine. Although TRIM has a proprietary report writer, third-party SQL report writers (such as Crystal Report Writer) may be used to report on the metadata collected about corporate records.

For imaging functionality, TRIM uses the Eastman Software viewer for low volumes, and the TOWER Technology integration for larger volumes. For mail systems, TRIM is MAPI-compliant, so it can be used with common packages such as Microsoft Exchange, Microsoft Mail, Lotus CC Mail, and Novell GroupWise.

Capabilities

This section describes the functionality that TRIM provides in terms of system setup, records manager functionality, and end user functionality.

IT Functionality/System Setup

We installed TRIM 4.1 by first installing and configuring the database. The system can use its own ISAM database or a third-party relational database. TRIMS' database tools allow administrators to create, maintain and repair TRIM databases, to check for referential integrity, to create fields, and to migrate to other databases.

After configuring the database, administrators must start TRIM, set up the "locations," and define security and caveats. Locations describe the staff structure or units of organization, and TRIM provides utilities to use the organization table from a database or a MAPI-compliant contact database. TRIM has 99 levels of security, and can provide security on each record type. Caveats can be used for additional security that can prevent a user – no matter what level of security – from being able to delete a record (e.g. staff-in confidence records).

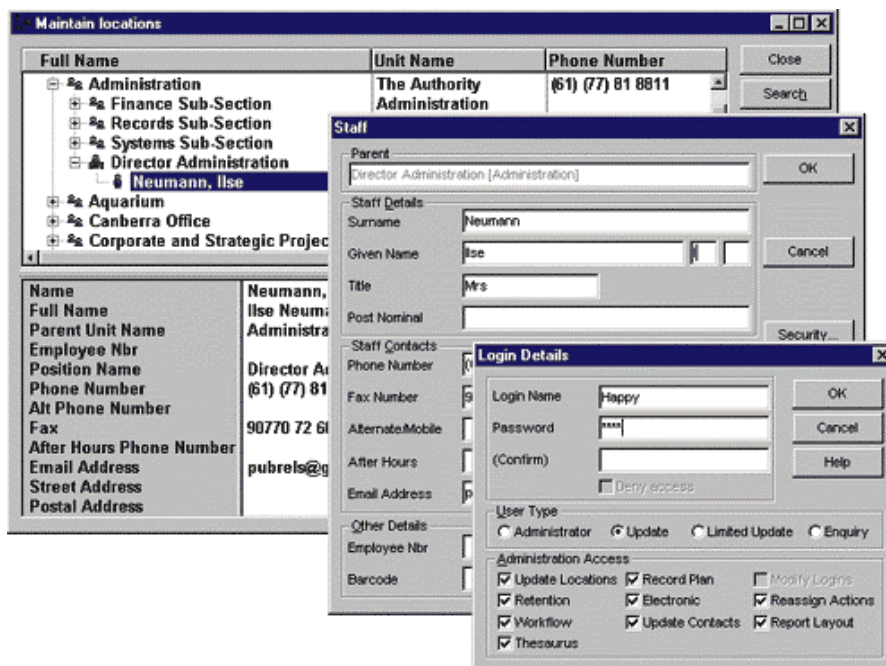


Figure 21 - TRIM Administration Security Interface

The administration interface is easy to understand. It has a login policy that can automatically log a user off within a certain period of time to save money on concurrent licenses, resources on the server, and bandwidth on the network. However, the system does not provide much integration with the operating system, such as leveraging the user and group definitions or the security in Windows NT. Such integration would save time for the administrator, especially for large systems with hundreds or thousands of users.

It should be noted, however, that multiple domains and security levels and users on Windows NT can require significant system administration and IT resources. (Consider, for example, the IT resource costs of 1,000 different users with one of 25 different security profiles). This is a good reason to track such information in TRIM.

In addition, information about which users have seen or amended corporate records is important in legal disputes and during the discovery processes. The fact that a person once existed is an important part of records management practices. TRIM adeptly tracks such information, which typically poses a challenge for Windows NT and IT administrators.

Records Manager Functionality

TRIM has a reputation for strong paper records management functionality, but the system is also strong in managing electronic records. Records management functions are accessed through a single user interface.

TRIM allows records managers to set up a filing structure for records, documents, and folders. Through techniques such as the record plan and the Thesaurus, corporate records can be associated with each other. TRIM allows flexibility in setting up the file plan, including customizable key table fields. The record plan module allows you to create a hierarchical file plan, with records that are defined by subject and record number. The interface has some nice features for setting up the document store, but it is not particularly intuitive.

TRIM's archive module allows records managers to set retention and disposition schedules and to archive records. Schedules can be attached to any object, both paper and electronic. Based on conditions such as last action, status change, or workflow, TRIM can trigger events such as make inactive, archive temporarily, archive permanently, and destroy. As required by various laws, TRIM retains the metadata about those corporate records that have been destroyed a retention schedule.

The screenshot shows a software window titled "Schedule - [6-5.2.3]". It has several input fields and buttons. The "Schedule Number" field contains "6-5.2.3". The "Subject" field contains "Audit". The "Description" field contains "Internal Audit; Preparation and implementation of work programs". The "Disposal" field contains "Archive 2 years after action complete" and "Destroy 6 years after action complete". The "Notes" field is empty. The "Source" field contains "GA6". There is a checkbox labeled "Agency Specific?" which is unchecked. On the right side, there are buttons for "OK", "Cancel", and "Help". At the bottom, there is a section titled "Triggers" which contains a list box with two items: "Archive permanently 2 years after last action" and "Destroy 6 years after last action". To the right of the list box are buttons for "New...", "Modify...", and "Remove".

Figure 22 - TRIM Retention and Disposition Scheduling Screen

TRIM can import records, record plans, retention schedules, staff members, record entry forms, record layouts, and document formats. For paper records migration, TRIM uses the familiar box metaphor to select and prepare items for migration, using a “work tray” staging area. TRIM supports accession and provides consignment listings, but it is difficult to do. TRIM provides space management capabilities, but no charge-back or notification.

TRIM provides extensive logging, but does not offer book-out tracking. This must be set up by a saved search and the “send to” e-mail options of TRIM. For reporting, TRIM provides its own proprietary reporting utility, with a number of default reports, including a workflow statistics report. Users can merge reports, modify them, preview them, and print them. TRIM allows reports to be published to the Web.

TRIM is the only records management product we’ve seen that provides workflow out of the box. The workflow capabilities are good for basic administrative or ad hoc routing applications that do not involve heavy transaction volumes. The system can be used for both electronic (on-line) and paper-driven (off-line) processes. For off-line workflows, TRIM generates a “to-do” list with barcodes that is printed, and can be tracked with a barcode reading device.

End User Functionality

For users, TRIM provides an RMS that includes basic DM and workflow, and that requires little involvement from IT groups. TRIM's TopDrawer interface gives users access to the system, even on remote machines. Users can search the repository and book records in and out. Booking in a record invokes a form that allows users to classify the record. TopDrawer has an image viewer, but does not support annotations.

TopDrawer can integrate with desktop tools such as Word via ODMA. Users can save documents from their desktop applications into TopDrawer while not connected to the TRIM system. Users can later add the documents to TRIM with a bulk "docking" facility. Remote capabilities eliminate some of the disadvantages of a fat-client architecture.



Figure 23 - TRIM TopDrawer integration with Microsoft Word

TRIM uses a proprietary search engine, which works quite well with the system. The search criteria may be "named" and saved for reuse at a later time. The actual results of the search may be saved. The results of a search appear in the result pane with the view pane being customizable to show your desired information. Currently, users cannot search across databases.

Although TRIM provides some basic capabilities for DM, it can also be integrated with PC DOCS. For example, PC DOCS can be used to manage active documents, with the documents moved to TRIM when they become inactive. However, users can still access the records from PC DOCS.

Overall, TRIM provides good functionality for records managers and end users, with considerable flexibility. While the interfaces are better than some other records management systems, they are still fairly complex and do not provide enough guidance or simplicity for novices and casual users.

Strengths and Challenges

The following table summarizes TRIM's strengths and challenges.

Strengths	Challenges
?? Strong records management functionality for both paper and electronic records	?? Little business-process flexibility
?? TopDrawer for working off-line; reduces disadvantages of fat client	?? User interfaces not overly intuitive
?? Includes basic workflow capabilities	?? Workflow limited for more sophisticated processes
?? Staged implementation	?? No accounting functionality
?? Quick installation	?? No cross-database searching
?? Requires minimal IT involvement	?? Report writer is proprietary, although you may use external report writers

Table 23 – Strengths and Challenges: TRIM

Ideal Deployment

TRIM is best suited for the following types of applications:

- ?? You currently need records management only, but you want the flexibility to integrate with an EDMS in the future
- ?? You primarily have an RM need, and want to use an EDMS as a collecting tool for important corporate records
- ?? You need to implement an RMS quickly, at a low cost, and with little IT involvement or support
- ?? You want an RMS with some EDMS functionality (as opposed to an EDMS with some records management functionality)
- ?? You have an administrative, records-driven process that needs more than just records management, but less than full DM and workflow
- ?? Your current needs are for paper records only, but you want the flexibility to include electronic records in the future

VII. CONCLUSION

As this report indicates, a wide variety of RMS products are available in the marketplace today. The products that we assessed offer an impressive array of features and functions for enterprise records management requirements.

It is interesting to see the different approach each product takes to address the problem of managing an organization's valuable content. In addition, it is interesting to note the rapidity with which the products in the DM arena are changing and evolving.

Obviously, different products have different strengths and are built to meet different sets of requirements. It is our hope that this report will serve as the first step for organizations to embark on a rigorous product analysis that focuses on the specific organizational requirements.

RMS and EDMS Trends

RMS should really be considered a complementary component of EDMS. So what does the future hold for these technologies? We believe that the market evolution for both technologies will be parallel.

Here are several key trends that we believe will be played out over the next one to two years – trends that will help DM and records management become mainstream applications.

?? **Internet enablement:** EDMS and RMS are poised to leverage the benefits of Internet technologies for corporate and external users. EDMS and RMS are also moving into areas such as Web content management, managing the creation and retrieval process and automating the publishing process – controlling content from the time it is created until it is “consumed” on the Web. In addition, technologies such as ActiveX and Java will enable more robust and customizable solutions that are easier to use and less expensive to administer.

- ?? **Technology consolidation:** the market is clearly moving toward packaged suites of electronic DM systems. Expect this trend to continue. Vendors will offer systems that provide DM, records management, imaging, workflow, and COLD capabilities, as well as the ability to integrate with other third-party systems. The result will be cohesive business solutions for document control.
- ?? **Vendor consolidation:** many newer, smaller vendors are coming to market with truly innovative products. We expect some consolidation to occur as larger vendors acquire some smaller vendors specifically for their technology.
- ?? **Simplified administration and integration:** there is still some inherent complexity in deploying EDMS and RMS, and the cost ownership is still not as low as for mainstream applications such as word processing. Many vendors are making strides in this area, such as leveraging the underlying operating and database systems to simplify administration.
- ?? **Transparent infrastructure:** EDMS and RMS will become more seamlessly integrated with authoring tools and operating systems. Users should not have to know or care that they are using EDMS or RMS. This will make systems more usable, and will lower the cost of administration and training associated with records management.

What Next?

So what can organizations do to ensure they are making informed choices about RMS technologies? This report is a good starting point, providing our methodology for comparing products and our reviews of many offerings that are currently available.

For end user organizations, this report should only be the first step of a comprehensive research and analysis process. It is critical to understand your organization's specific requirements and weigh the strengths of the different products against those requirements.

Keep in mind that you need to consider much more than just core functionality when evaluating a product and a vendor. Company size, market position, and support will be important to you. So will a system's performance characteristics and the ability to support your enterprise. Cost of ownership is also important – with some products, the cost of deploying and managing an enterprise system can be large.

It is also important to remember that technology changes rapidly, which can make evaluations even more difficult. When evaluating products, consider the vendors' future direction as well as their current offerings, and match this to your own corporate direction. It is also important to keep up to date on the current independent research and analysis to ensure you are making an informed decision.

